LINEAR SYSTEMS

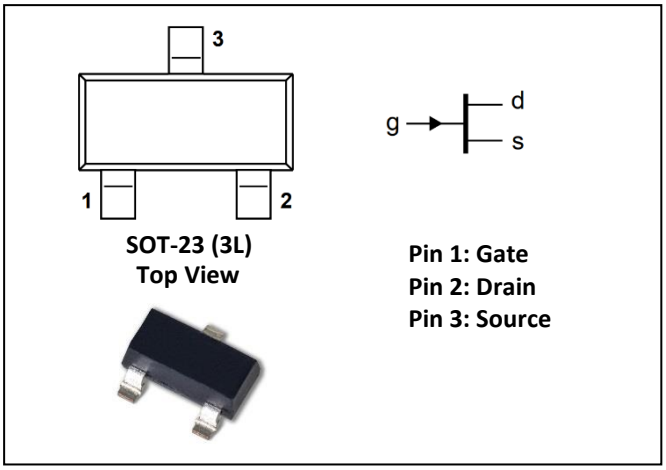
Improved Standard Products®

LSBF510

High Gain, Single N-Channel JFET Amplifier

General Purpose, Low-Noise, Low-Cost, Single N-Channel JFET, Replacement for the BF510

Absolute Maximum Ratings @ 25 °C (unless otherwise stated)	
Maximum Temperatures	
Storage Temperature	-65 to +150°C
Junction Operating Temperature	-55 to +150°C
Maximum Power Dissipation	
Continuous Power Dissipation @ +25°C	350mW
Maximum Currents	
Gate Forward Current	$I_{G(F)}$ = 10mA
Maximum Voltages	
Gate to Source	V_{GSS} = 30V
Gate to Drain	V_{GDS} = 30V



Features

- Low Cutoff Voltage: <2.5V
- High Input Impedance
- Very Low Noise
- High Gain: AV = 80 @ 20 µA
- Reverse Gate to Source and Drain Voltage ≥| -30V

Benefits

- Low Cost
- Excellent Low Power Supply Operation
- Power Supply: Down to 2.5V
- Low Signal Loss/System Error
- High System Sensitivity
- High Quality Low-Level Signal

Applications

- High-Gain, Low Noise Amplifiers
- Low-Current, Low-Voltage
- Battery-Powered Amplifiers
- Infrared Detector Amplifiers
- Ultra-High Input Impedance Pre-Amplifiers

Description

The LSBF510 is a low-cost N-Channel JFET. Features include low leakage, very low noise, low cutoff voltage ($V_{GS(off)} \leq 2.5V$) and high Gain (A_V = 80 V/V) for use with low-level power supplies. The LSBF510 is excellent for battery powered equipment and low current amplifiers. The TO-236 (SOT-23) package provides surface-mount capability. The LSBF510 is available in tape-and-reel for automated assembly and in die form for automated assembly.

Electrical Characteristics @ 25 °C (unless otherwise stated)

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
BV_{GSS}	Gate to Source Breakdown Voltage	-30			V	I_G = -1µA, V_{DS} = 0.0V
$V_{GS(off)}$	Gate to Source Cutoff Voltage	-0.3		-2.5		V_{DS} = 15V, I_D = 10nA
I_{DSS}	Drain to Source Saturation Current[2]	0.2		3.0	mA	V_{DS} = 15V, V_{GS} = 0.0V
I_{GSS}	Gate Reverse Current			-200	pA	V_{GS} = -20V, V_{DS} = 0.0V
I_G	Gate Operating Current		-2			V_{DG} = 10V, I_D = 0.1mA
$I_{D(off)}$	Drain Cutoff Current		2			V_{DS} = 15V, V_{GS} = 5.0V
g_{fs}	Forward Transconductance	0.5			mS	V_{DS} = 15V, V_{GS} = 0.0V, *f* = 1kHz
C_{iss}	Input Capacitance			4.5	pF	V_{DS} = 15V, V_{GS} = 0.0V, *f* = 1MHz
C_{rss}	Reverse Transfer Capacitance		1.3			
e_n	Noise Voltage		3.0		nV/√Hz	V_{DS} = 10V, I_D = 2mA, *f* = 1kHz

Typical Characteristics

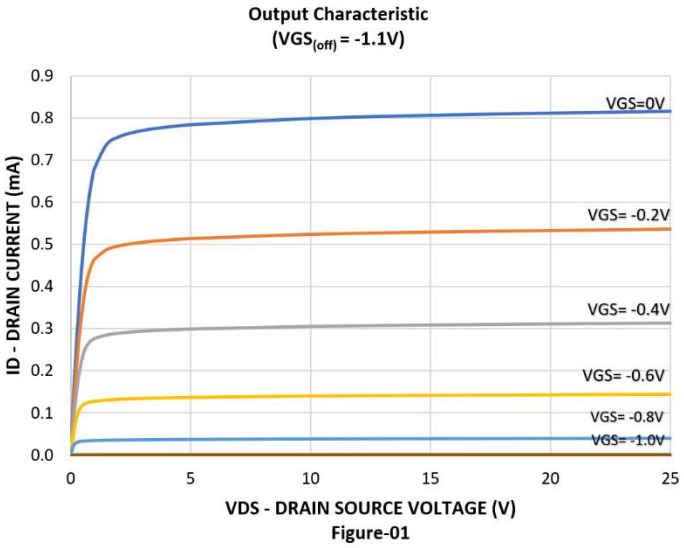


Figure-01

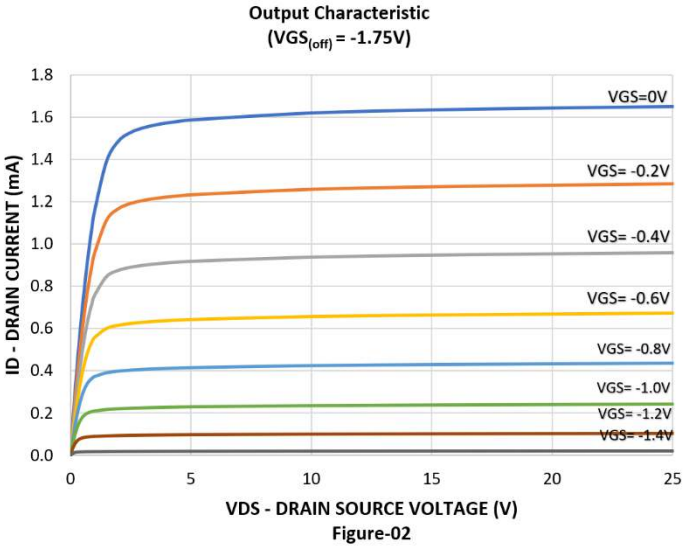


Figure-02

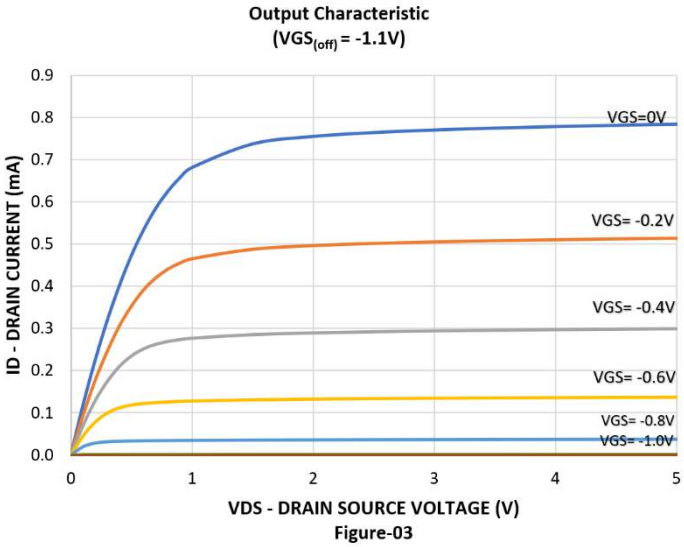


Figure-03

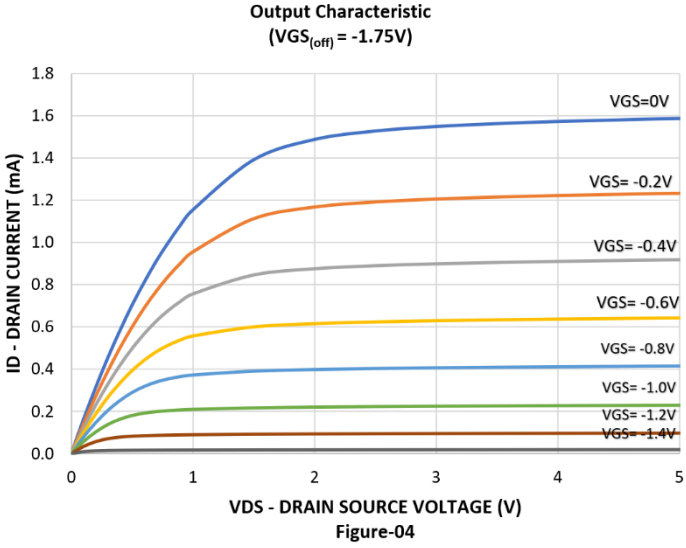


Figure-04

Typical Characteristics Continued

Output Characteristic
($VGS_{(off)}$ = -1.1V)

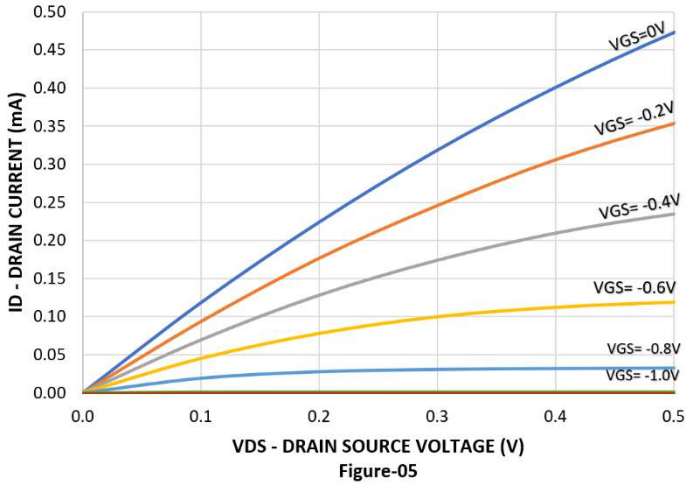


Figure-05

Output Characteristic
($VGS_{(off)}$ = -1.75V)

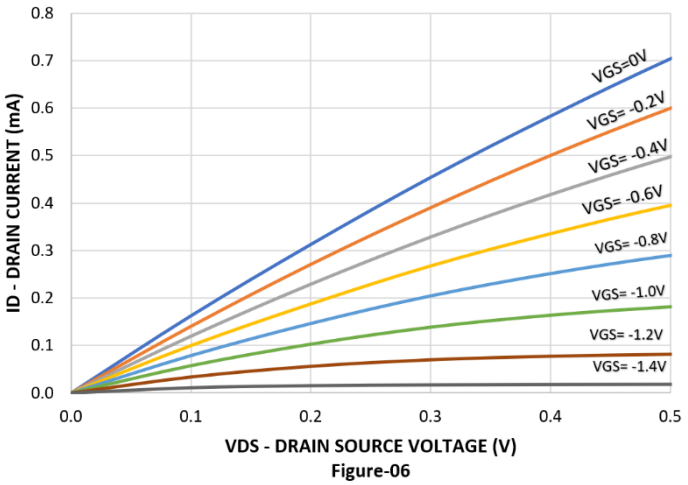


Figure-06

Transfer Characteristics

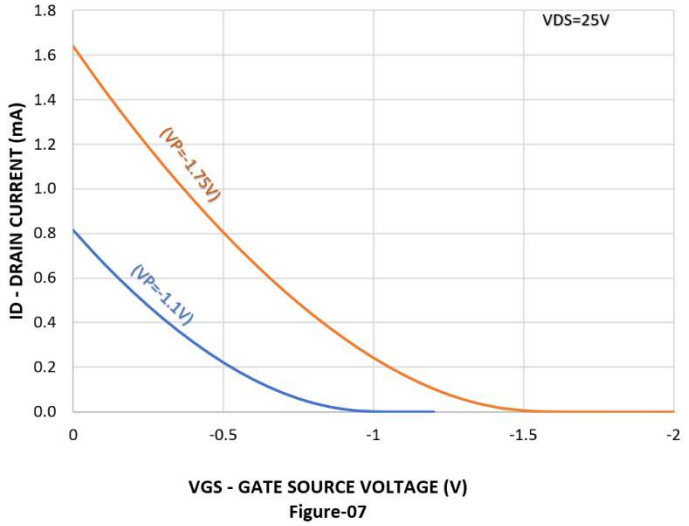


Figure-07

Operating Gate Current

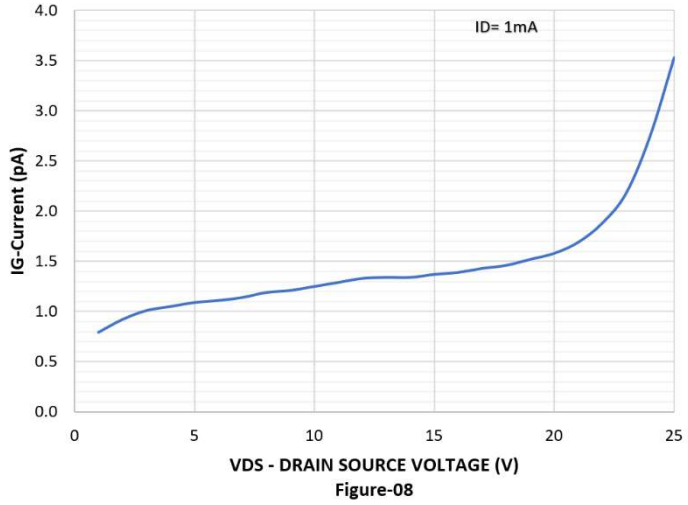


Figure-08

Typical Characteristics Continued

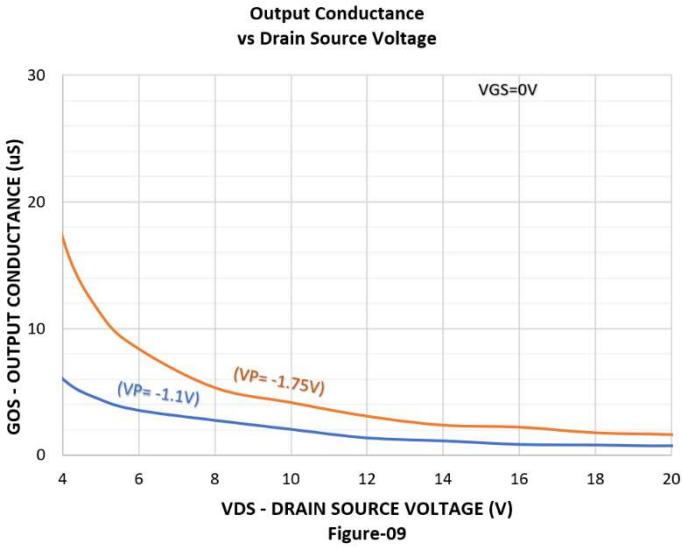


Figure-09

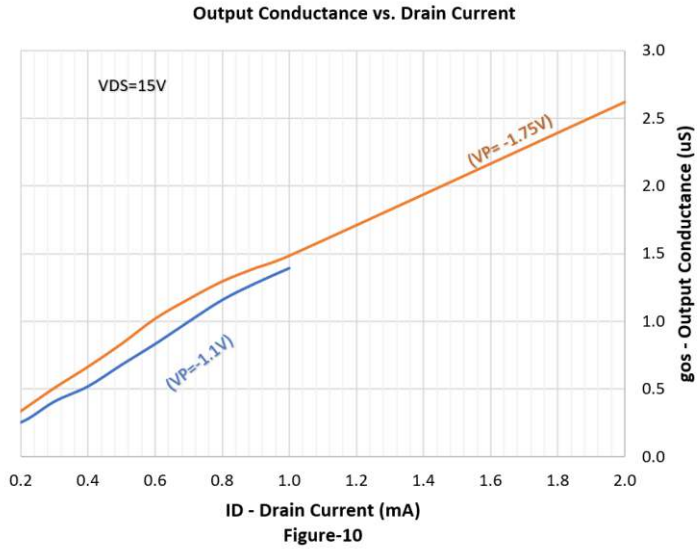


Figure-10

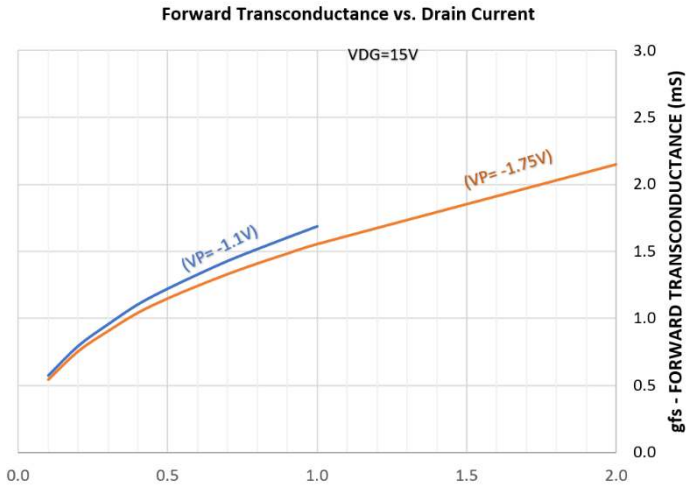


Figure-11

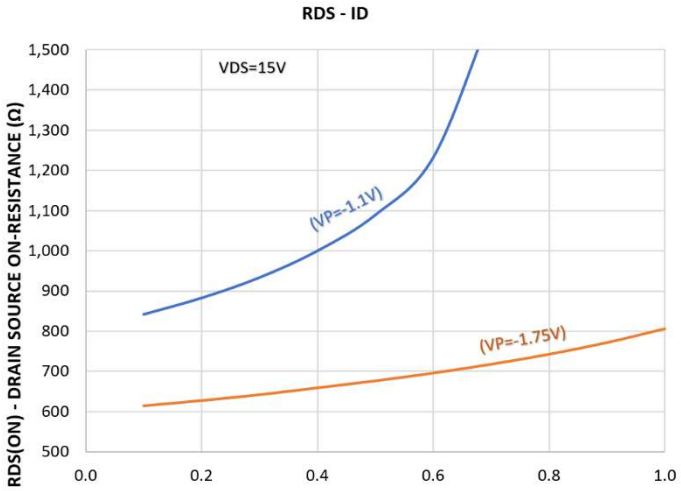
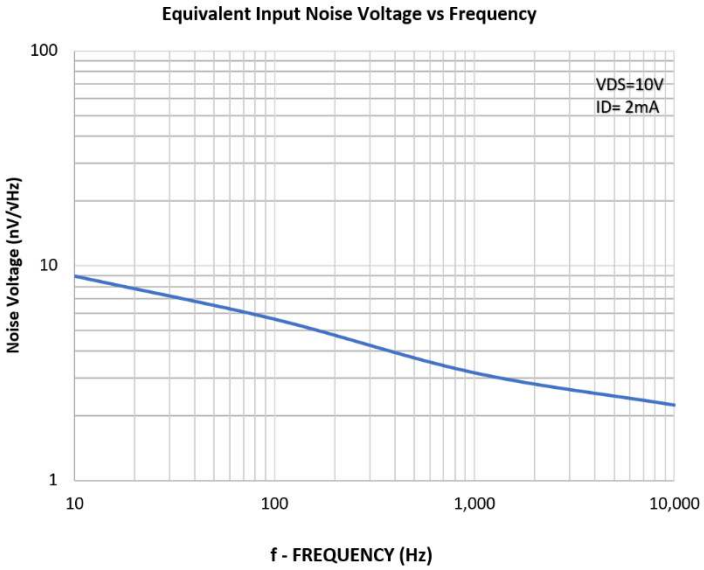


Figure-12

Typical Characteristics Continued



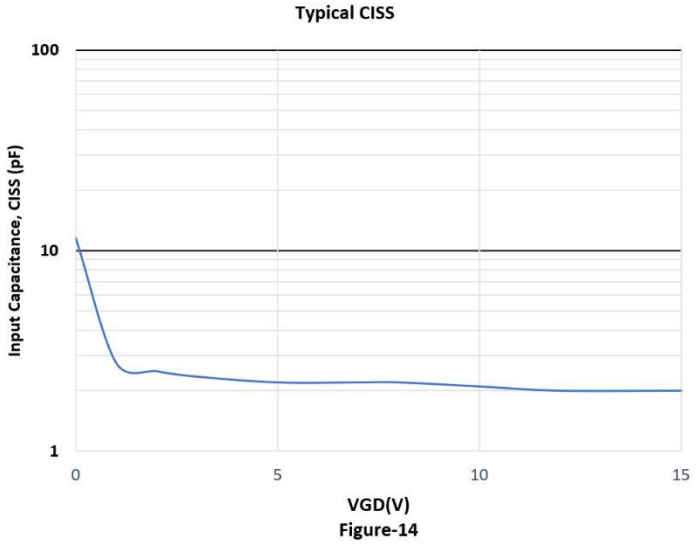
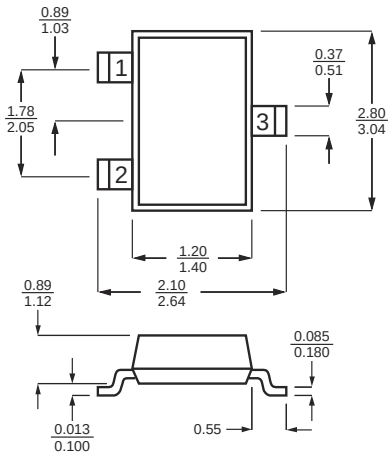


Figure-14

Package Dimensions

SOT-23 3 Lead



DIMENSIONS IN MILLIMETERS

Ordering Information

STANDARD PART CALL-OUT
LSBF510 SOT-23 3L RoHS
CUSTOM PART CALL-OUT
(CUSTOM PARTS INCLUDE SEL + 4 DIGIT NUMERIC CODE)
LSBF510 SOT-23 3L RoHS SELXXXX

Notes

1. Absolute maximum ratings are limiting values above which serviceability may be impaired.
2. Pulse Test: PW ≤ 300µs, Duty Cycle ≤ 3%
3. All characteristics MIN/TYP/MAX numbers are absolute values. Negative values indicate electrical polarity only.
4. When ordering include the full Linear Systems part number and package type. Linear Systems creates custom parts on a case by case basis. To learn whether Linear Systems can meet your requirements, please send your drawing along with a detailed description of the device specifications to sales@linearsystems.com. One of our qualified representatives will contact you.
5. All standard parts are RoHS compliant. Contact the factory for availability of non-RoHS parts.
6. Information furnished by Linear Integrated Systems is believed to be accurate and reliable. However, no responsibility is assumed for its use; nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Linear Integrated Systems.