LINEAR SYSTEMS

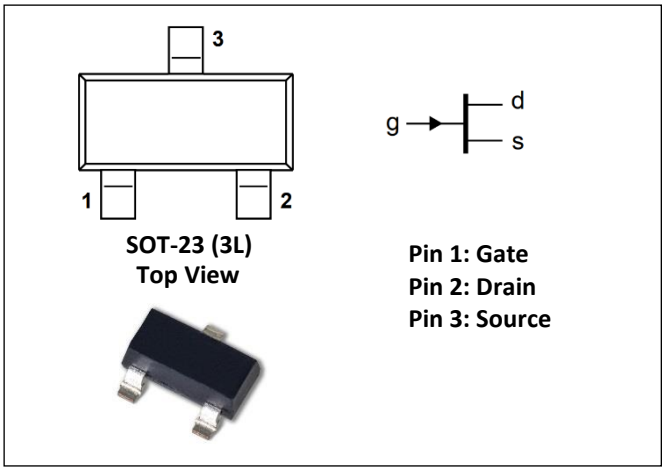
Improved Standard Products®

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

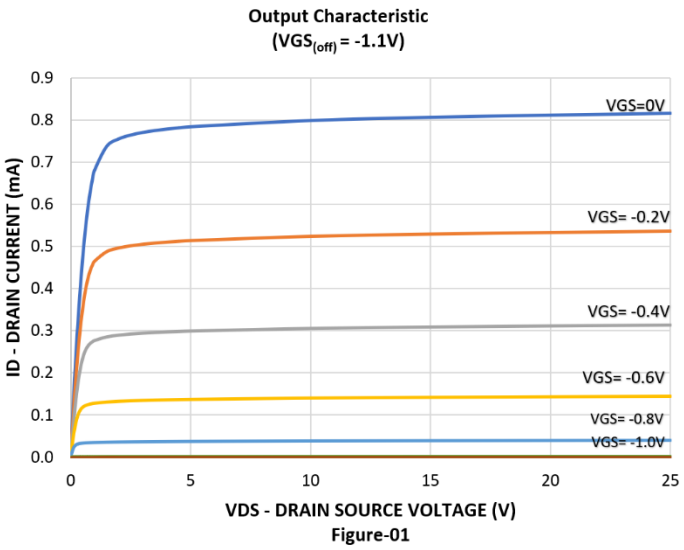


Figure-01

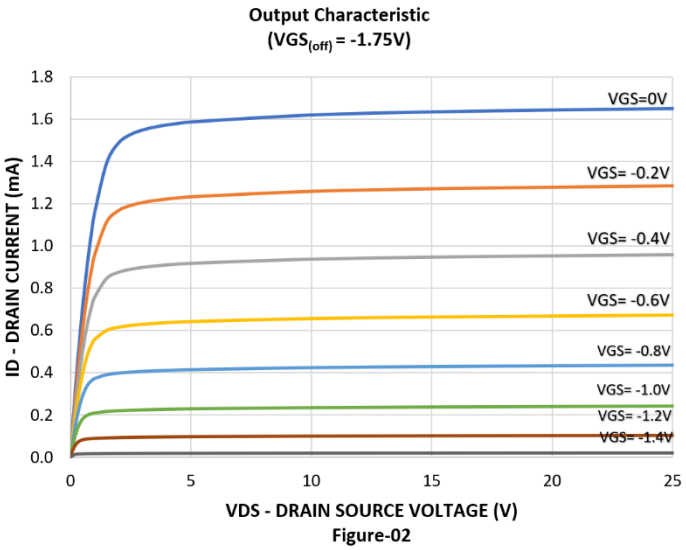


Figure-02

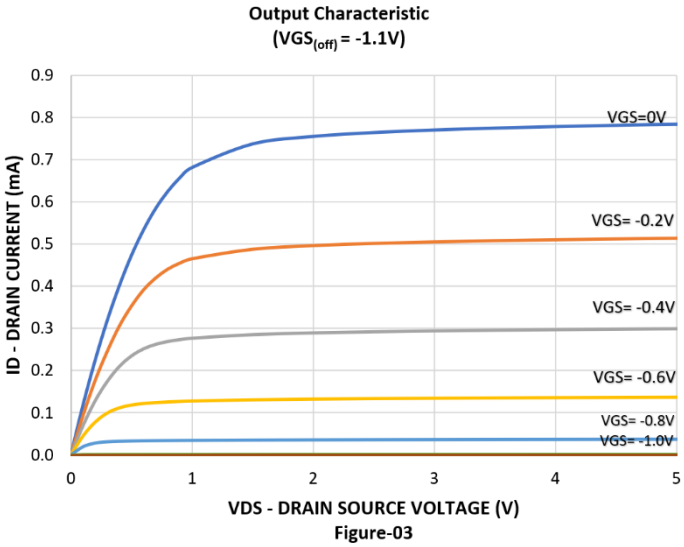


Figure-03

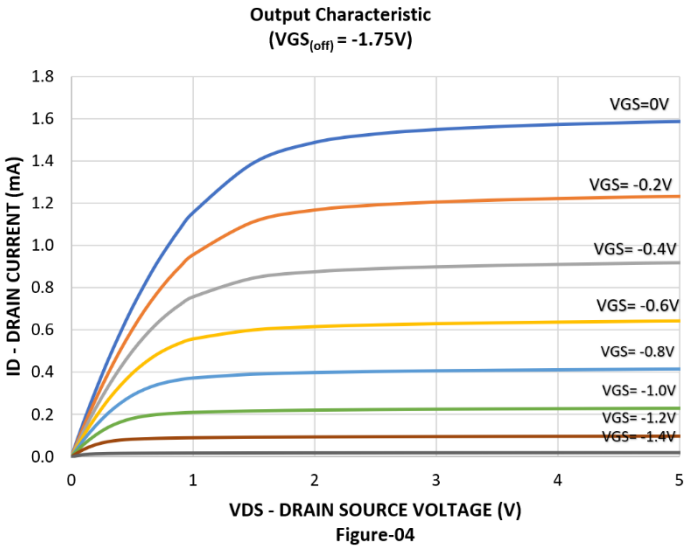


Figure-04

Typical Characteristics Continued

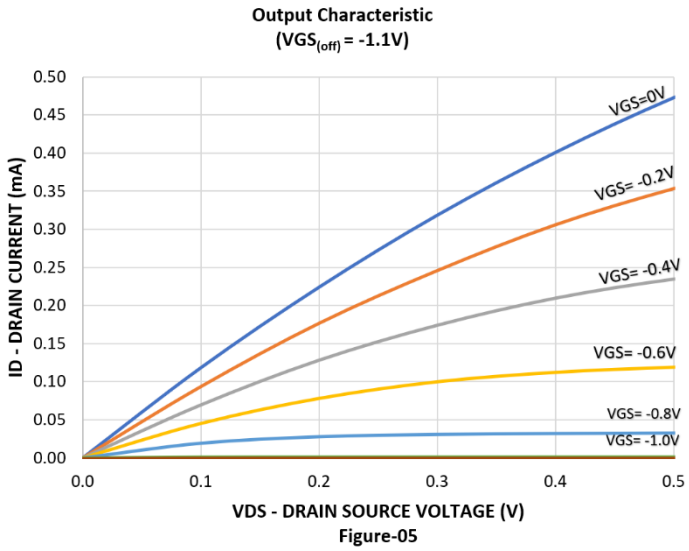


Figure-05

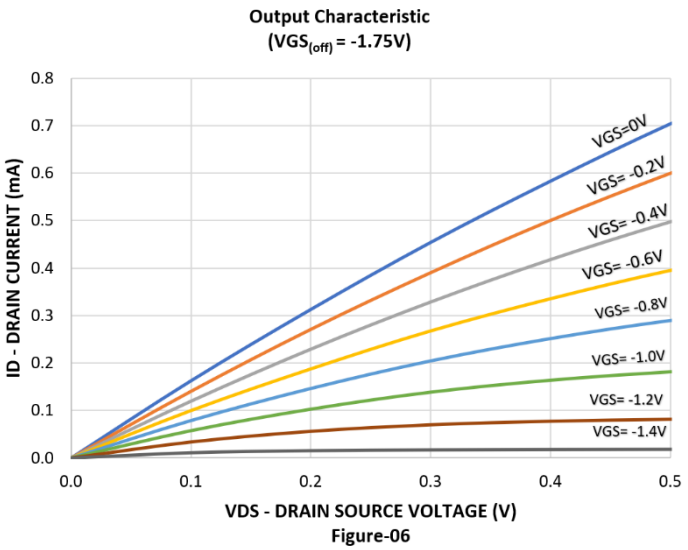


Figure-06

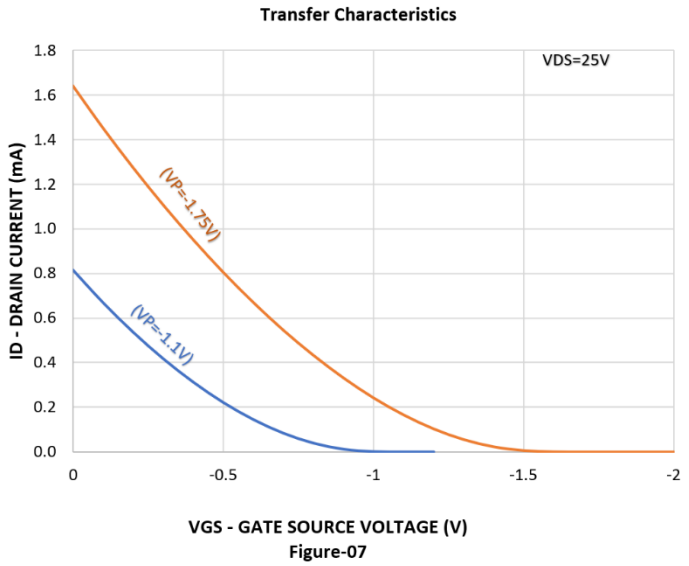


Figure-07

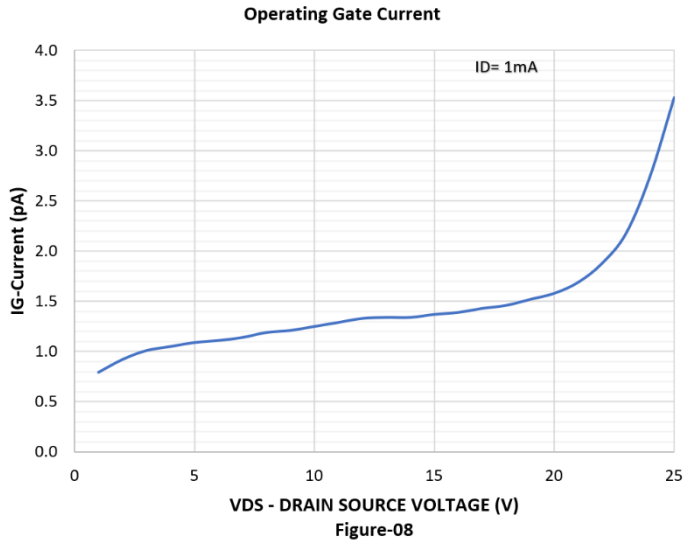


Figure-08

Typical Characteristics Continued

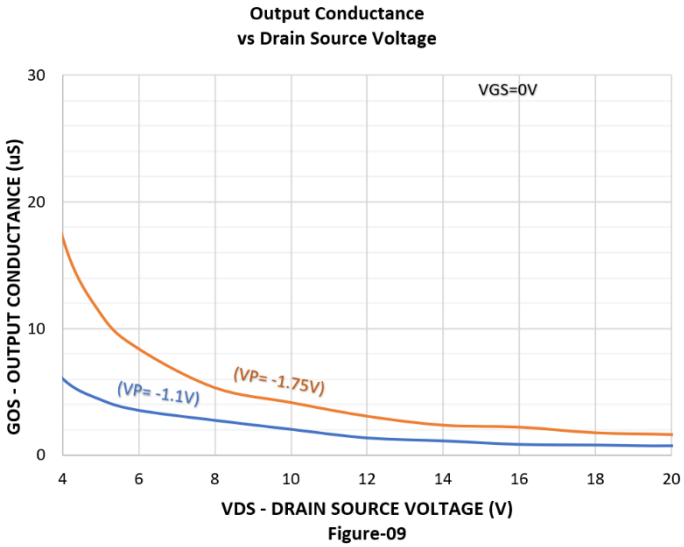


Figure-09

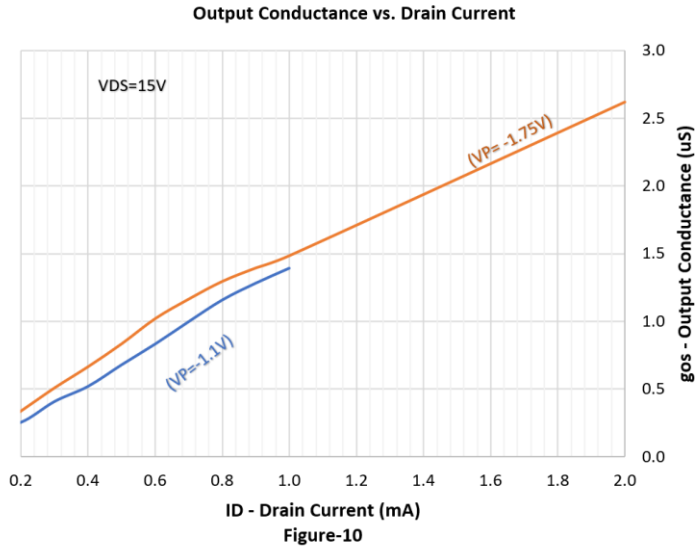


Figure-10

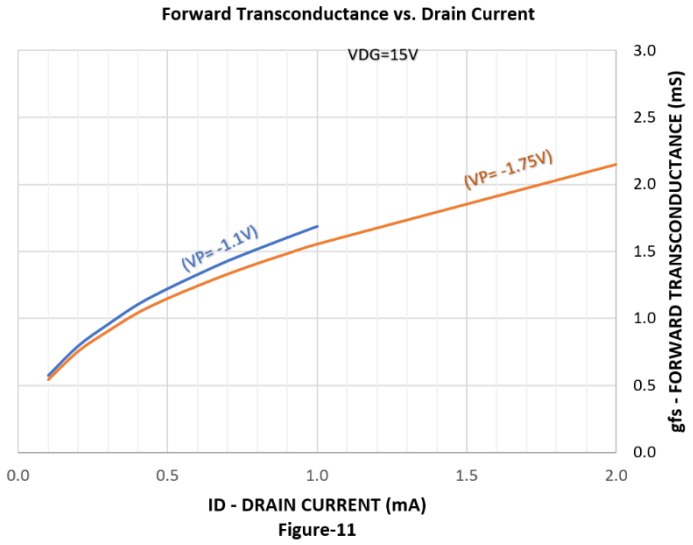


Figure-11

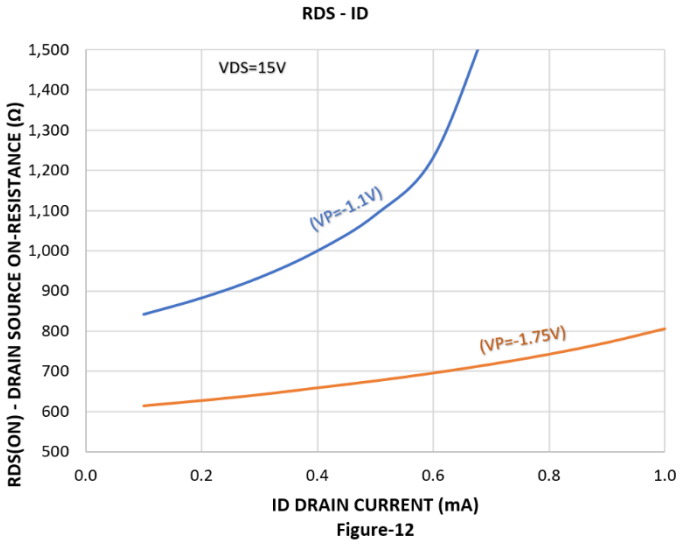
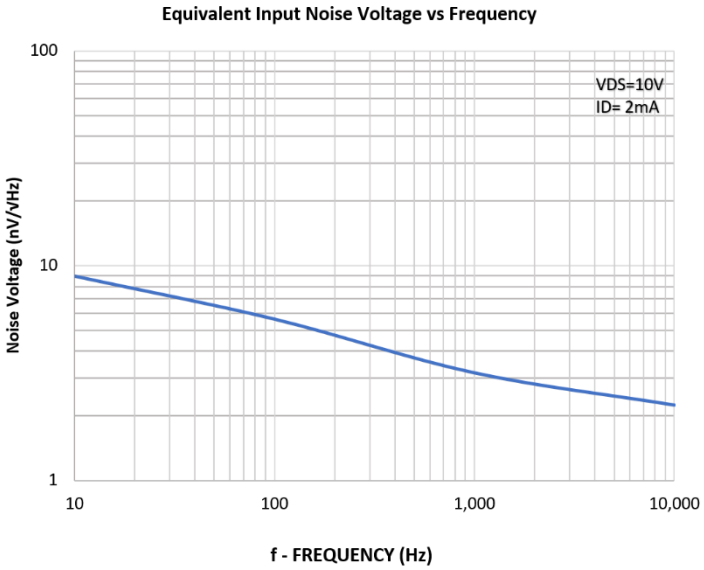


Figure-12

Typical Characteristics Continued



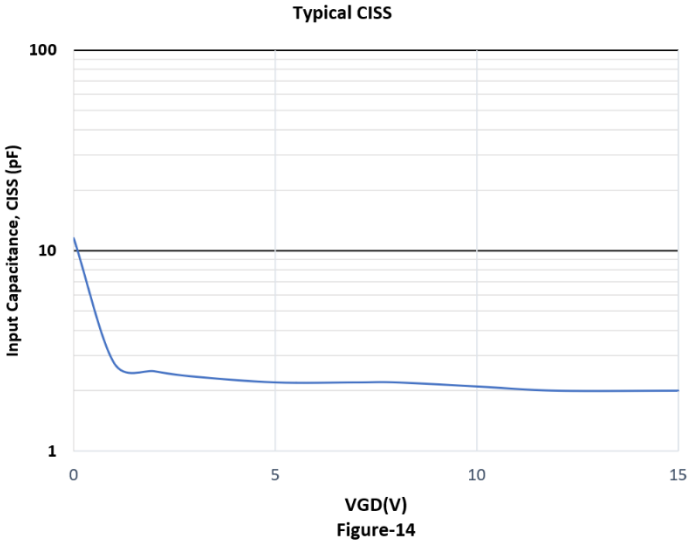
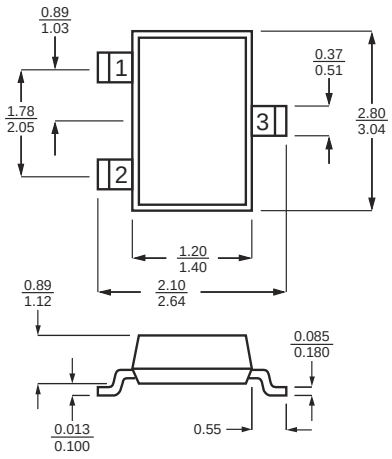


Figure-14

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.
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