

## Linear Systems replaces discontinued Siliconix U309

The U309 is a high frequency n-channel JFET offering a wide range and low noise performance. The hermetically sealed TO-18 package is well suited for high reliability and harsh environment applications.

(See Packaging Information).

### U309 Benefits:

- High Power Low Noise gain
- Dynamic Range greater than 100dB
- Easily matched to 75Ω input

### U309 Applications:

- UHV / VHF Amplifiers
- Mixers
- Oscillators

### FEATURES

DIRECT REPLACEMENT FOR SILICONIX U309

OUTSTANDING HIGH FREQUENCY GAIN  $G_{DG} = 11.5\text{dB}$

LOW HIGH FREQUENCY NOISE  $NF = 2.7\text{dB}$

ABSOLUTE MAXIMUM RATINGS @ 25°C<sup>1</sup>

#### Maximum Temperatures

Storage Temperature -55°C to +150°C

Operating Junction Temperature -55°C to +135°C

#### Maximum Power Dissipation

Continuous Power Dissipation 500mW

#### MAXIMUM CURRENT

Gate Current 10mA

#### MAXIMUM VOLTAGES

Gate to Drain Voltage or Gate to Source Voltage -25V

### U309 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNIT	CONDITIONS
$BV_{GSS}$	Gate to Source Breakdown Voltage	-25	--	--	V	$V_{DS} = 0V, I_G = -1\mu A$
$V_{GS(F)}$	Gate to Source Forward Voltage	0.7	--	1		$V_{DS} = 0V, I_G = 10mA$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	-1	--	-4		$V_{DS} = 10V, I_D = 1nA$
$I_{DSS}$	Drain to Source Saturation Current <sup>2</sup>	12	--	30	mA	$V_{DS} = 10V, V_{GS} = 0V$
$I_G$	Gate Operating Current (Note 3)	--	-15	--	pA	$V_{DG} = 9V, I_D = 10mA$
$r_{DS(on)}$	Drain to Source On Resistance	--	35	--	Ω	$V_{GS} = 0V, I_D = 1mA$

### U309 DYNAMIC ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNIT	CONDITIONS
$g_{fs}$	Forward Transconductance	10	14		mS	$V_{DS} = 10V, I_D = 10mA, f = 1kHz$
$g_{os}$	Output Conductance	--	110	250	μS	
$C_{iss}$	Input Capacitance	--	4	5	pF	$V_{DS} = 10V, V_{GS} = -10V, f = 1MHz$
$C_{rss}$	Reverse Transfer Capacitance	--	1.9	2.5		
$e_n$	Equivalent Noise Voltage	6	--	--	nV/√Hz	$V_{DS} = 10V, I_D = 10mA, f = 100Hz$

### U309 HIGH FREQUENCY CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNIT	CONDITIONS	
NF	Noise Figure	f = 105MHz	--	1.5	--	dB	$V_{DS} = 10V, I_D = 10mA$
		f = 450MHz	--	2.7	--	dB	
$G_{pg}$	Power Gain <sup>3</sup>	f = 105MHz	--	16	--		
		f = 450MHz	--	11.5	--		
$g_{fg}$	Forward Transconductance	f = 105MHz	--	14	--	mS	
		f = 450MHz	--	13	--		
$g_{og}$	Output Conductance	f = 105MHz	--	0.16	--		
		f = 450MHz	--	0.55	--		

Note 1 - Absolute maximum ratings are limiting values above which U309 serviceability may be impaired.

Note 2 - Pulse test :  $PW \leq 300\mu s$ , Duty Cycle  $\leq 3\%$

Note 3 - Measured at optimum input noise match

Micross Components Europe

Available Packages:

TO-18 (Bottom View)



U309 in TO-18  
U309 in bare die.

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Please contact Micross for full package and die dimensions

