

## Linear Systems replaces discontinued Siliconix 2N5114

This analog switch is designed for inverting switching into inverting input of an Operational Amplifier.

The SOT-23 package provides ease of manufacturing, and a lower cost assembly option.

(See Packaging Information).

### LS5114 Benefits:

- Low On Resistance
- $I_{D(off)} \leq 500 \text{ pA}$
- Switches directly from TTL logic

### LS5114 Applications:

- Analog Switches
- Commutators
- Choppers

### FEATURES

DIRECT REPLACEMENT FOR SILICONIX 2N5114

LOW ON RESISTANCE  $r_{DS(on)} \leq 75\Omega$

LOW CAPACITANCE 6pF

ABSOLUTE MAXIMUM RATINGS @ 25°C (unless otherwise noted)

#### Maximum Temperatures

Storage Temperature -55°C to +200°C

Operating Junction Temperature -55°C to +200°C

#### Maximum Power Dissipation

Continuous Power Dissipation 500mW

#### MAXIMUM CURRENT

Gate Current (Note 1)  $I_G = -50\text{mA}$

#### MAXIMUM VOLTAGES

Gate to Drain Voltage  $V_{GDS} = 30\text{V}$

Gate to Source Voltage  $V_{GSS} = 30\text{V}$

### LS5114 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$BV_{GSS}$	Gate to Source Breakdown Voltage	30	--	--	V	$I_G = 1\mu\text{A}, V_{DS} = 0\text{V}$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	4	--	10		$V_{DS} = -15\text{V}, I_D = -1\text{nA}$
$V_{GS(F)}$	Gate to Source Forward Voltage	--	-0.7	-1		$I_G = -1\text{mA}, V_{DS} = 0\text{V}$
$V_{DS(on)}$	Drain to Source On Voltage	--	-1.0	-1.3	V	$V_{GS} = 0\text{V}, I_D = -15\text{mA}$
		--	-0.7	--		$V_{GS} = 0\text{V}, I_D = -7\text{mA}$
		--	-0.5	--		$V_{GS} = 0\text{V}, I_D = -3\text{mA}$
$I_{DSS}$	Drain to Source Saturation Current (Note 2)	-30	--	-90	mA	$V_{DS} = -18\text{V}, V_{GS} = 0\text{V}$
$I_{GSS}$	Gate Reverse Current	--	5	500	pA	$V_{GS} = 20\text{V}, V_{DS} = 0\text{V}$
$I_G$	Gate Operating Current	--	-5	--		$V_{DS} = -15\text{V}, I_D = -1\text{mA}$
$I_{D(off)}$	Drain Cutoff Current	--	-10	-500		$V_{DS} = -15\text{V}, V_{GS} = 12\text{V}$
		--	-10	--	$V_{DS} = -15\text{V}, V_{GS} = 7\text{V}$	
		--	-10	--	$V_{DS} = -15\text{V}, V_{GS} = 5\text{V}$	
$r_{DS(on)}$	Drain to Source On Resistance	--	--	75	$\Omega$	$I_D = -1\text{mA}, V_{GS} = 0\text{V}$

### LS5114 DYNAMIC ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$g_{fs}$	Forward Transconductance	--	4.5	--	mS	$V_{DS} = -15\text{V}, I_D = 1\text{mA}, f = 1\text{kHz}$
$g_{os}$	Output Conductance	--	20	--	$\mu\text{S}$	
$r_{DS(on)}$	Drain to Source On Resistance	--	--	75	$\Omega$	$I_D = 0\text{A}, V_{GS} = 0\text{V}, f = 1\text{kHz}$
$C_{iss}$	Input Capacitance	--	20	25	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
$C_{rss}$	Reverse Transfer Capacitance	--	5	7		$V_{DS} = 0\text{V}, V_{GS} = 12\text{V}, f = 1\text{MHz}$
		--	6	--		$V_{DS} = 0\text{V}, V_{GS} = 7\text{V}, f = 1\text{MHz}$
		--	6	--	$V_{DS} = 0\text{V}, V_{GS} = 5\text{V}, f = 1\text{MHz}$	
$e_n$	Equivalent Noise Voltage	--	20	--	nV/VHz	$V_{DG} = 10\text{V}, I_D = 10\text{mA}, f = 1\text{kHz}$

### LS5114 SWITCHING CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	UNITS	CONDITIONS
$t_{d(on)}$	Turn On Time	6	$V_{GS(L)} = -11\text{V}$ $V_{GS(H)} = 0\text{V}$ See Switching Circuit
$t_r$	Turn On Rise Time	10	
$t_{d(off)}$	Turn Off Time	6	
$t_f$	Turn Off Fall Time	15	

Note 1 - Absolute maximum ratings are limiting values above which LS5114 serviceability may be impaired. Note 2 - Pulse test:  $PW \leq 300 \mu\text{s}$ , Duty Cycle  $\leq 3\%$

### LS5114 SWITCHING CIRCUIT PARAMETERS

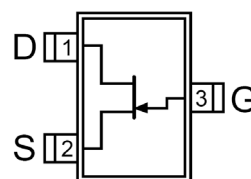
$V_{DD}$	-10V
$V_{GG}$	20V
$R_L$	430 $\Omega$
$R_G$	100 $\Omega$
$I_{D(on)}$	-15mA

Available Packages:

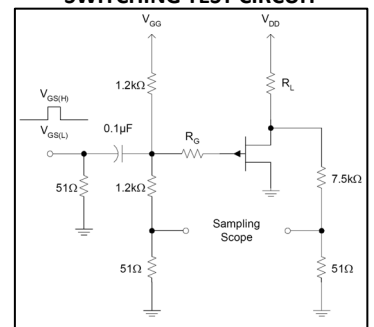
LS5114 in SOT-23  
LS5114 in bare die.

Please contact Micross for full package and die dimensions

SOT-23 (Top View)



### SWITCHING TEST CIRCUIT



Micross Components Europe