

## Linear Systems replaces discontinued Siliconix 2N5116

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

The hermetically sealed TO-18 package is well suited for hi-reliability and harsh environment applications.

(See Packaging Information).

### 2N5116 Benefits:

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

### 2N5116 Applications:

- Analog Switches
- Commutators
- Choppers

### FEATURES

DIRECT REPLACEMENT FOR SILICONIX 2N5116

LOW ON RESISTANCE  $r_{DS(on)} \leq 150\Omega$

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)  $I_G = -50$ mA

#### MAXIMUM VOLTAGES

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

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

### 2N5116 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$BV_{GSS}$	Gate to Source Breakdown Voltage	30	--	--	V	$I_G = 1\mu A, V_{DS} = 0V$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1	--	4		$V_{DS} = -15V, I_D = -1nA$
$V_{GS(F)}$	Gate to Source Forward Voltage	--	-0.7	-1		$I_G = -1mA, V_{DS} = 0V$
$V_{DS(on)}$	Drain to Source On Voltage	--	-1.0	--	mV	$V_{GS} = 0V, I_D = -15mA$
		--	-0.7	--		$V_{GS} = 0V, I_D = -7mA$
		--	-0.5	-0.6		$V_{GS} = 0V, I_D = -3mA$
$I_{DSS}$	Drain to Source Saturation Current (Note 2)	-5	--	-25	mA	$V_{DS} = -15V, V_{GS} = 0V$
$I_{GSS}$	Gate Reverse Current	--	5	500	pA	$V_{GS} = 20V, V_{DS} = 0V$
$I_G$	Gate Operating Current	--	-5	--		$V_{DS} = -15V, I_D = -1mA$
$I_{D(off)}$	Drain Cutoff Current	--	-10	--		$V_{DS} = -15V, V_{GS} = 12V$
		--	-10	--	$V_{DS} = -15V, V_{GS} = 7V$	
		--	-10	-500	$V_{DS} = -15V, V_{GS} = 5V$	
$r_{DS(on)}$	Drain to Source On Resistance	--	--	150	$\Omega$	$I_D = -1mA, V_{GS} = 0V$

### 2N5116 DYNAMIC ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
$g_{fs}$	Forward Transconductance	--	4.5	--	mS	$V_{DS} = -15V, I_D = 1mA, f = 1kHz$
$g_{os}$	Output Conductance	--	20	--	$\mu S$	
$r_{DS(on)}$	Drain to Source On Resistance	--	--	150	$\Omega$	$I_D = 0A, V_{GS} = 0V, f = 1kHz$
$C_{iss}$	Input Capacitance	--	20	25	pF	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$
$C_{rss}$	Reverse Transfer Capacitance	--	5	--		$V_{DS} = 0V, V_{GS} = 12V, f = 1MHz$
		--	6	--		$V_{DS} = 0V, V_{GS} = 7V, f = 1MHz$
		--	6	7		$V_{DS} = 0V, V_{GS} = 5V, f = 1MHz$
$e_n$	Equivalent Noise Voltage	--	20	--	nV/VHz	$V_{DG} = 10V, I_D = 10mA, f = 1kHz$

### 2N5116 SWITCHING CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	UNITS	CONDITIONS
$t_{d(on)}$	Turn On Time	12	$V_{GS(L)} = -5V$ $V_{GS(H)} = 0V$ See Switching Circuit
$t_r$	Turn On Rise Time	30	
$t_{d(off)}$	Turn Off Time	10	
$t_f$	Turn Off Fall Time	50	

Note 1 - Absolute maximum ratings are limiting values above which 2N5116 serviceability may be impaired. Note 2 - Pulse test:  $PW \leq 300 \mu s$ , Duty Cycle  $\leq 3\%$

### 2N5116 SWITCHING CIRCUIT PARAMETERS

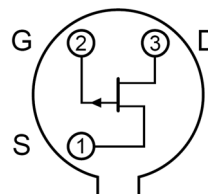
$V_{DD}$	-6V
$V_{GG}$	8V
$R_L$	2k $\Omega$
$R_G$	390 $\Omega$
$I_{D(on)}$	-3mA

Available Packages:

2N5116 in TO-18  
2N5116 in bare die.

Please contact Micross for full package and die dimensions

TO-18 (Bottom View)



### SWITCHING TEST CIRCUIT

