LINEAR SYSTEMS

2N4391
Single N-Channel JFET switch

micross

Linear Systems replaces discontinued Siliconix 2N4391

The 2N4391 features many of the superior characteristics of JFETs which make it a good choice for demanding analog switching applications and for specialized amplifier circuits.

2N4391 Benefits:

- Low Error Voltage
- High-Speed Analog Circuit Performance
- Negligible "Off-Error," Excellent Accuracy
- Good Frequency Response, Low Glitches
- Eliminates Additional Buffering

2N4391 Applications:

- Analog Switches
- Choppers, Sample-and-Hold
- Normally "On" Switches, Current Limiters

FEATURES	
DIRECT REPLACEMENT FOR SILICONIX 2N4391	
LOW ON RESISTANCE	$r_{DS(on)} \leq 30\Omega$
LOW GATE OPERATING CURRENT	$I_{D(off)} = 5pA$
FAST SWITCHING	$t_{(ON)} \leq 15ns$
ABSOLUTE MAXIMUM RATINGS[1] @ 25°C (unless otherwise noted)	
Maximum Temperatures	
Storage Temperature	-65°C to +200°C
Operating Junction Temperature	-55°C to +200°C
Maximum Power Dissipation	
Continuous Power Dissipation	1800mW
MAXIMUM CURRENT	
Gate Current (Note 1)	$I_G = 50mA$
MAXIMUM VOLTAGES	
Gate to Drain Voltage / Gate to Source Voltage	-40V

2N4391 ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN	TYP.	MAX	UNITS	CONDITIONS
BV_{GSS}	Gate to Source Breakdown Voltage	-40	--	--	V	$I_G = -1\mu A$, $V_{DS} = 0V$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	-4	--	-10		$V_{DS} = 20V$, $I_D = 1nA$
$V_{GS(F)}$	Gate to Source Forward Voltage	--	0.7	1		$I_G = 1mA$, $V_{DS} = 0V$
$V_{DS(on)}$	Drain to Source On Voltage	--	0.25	--		$V_{GS} = 0V$, $I_D = 3mA$
$V_{DS(on)}$	Drain to Source On Voltage	--	0.3	--		$V_{GS} = 0V$, $I_D = 6mA$
$V_{DS(on)}$	Drain to Source On Voltage	--	0.35	0.4		$V_{GS} = 0V$, $I_D = 12mA$
I_{DSS}	Drain to Source Saturation Current[2]	50	--	150	mA	$V_{DS} = 20V$, $V_{GS} = 0V$
I_{GSS}	Gate Reverse Current	--	-5	-100	pA	$V_{GS} = -20V$, $V_{DS} = 0V$
I_G	Gate Operating Current	--	-5	--		$V_{DG} = 15V$, $I_D = 10mA$
$I_{D(off)}$	Drain Cutoff Current	--	5	--		$V_{DS} = 20V$, $V_{GS} = -5V$
		--	5	--		$V_{DS} = 20V$, $V_{GS} = -7V$
		--	5	100		$V_{DS} = 20V$, $V_{GS} = -12V$
$r_{DS(on)}$	Drain to Source On Resistance	--	--	30	Ω	$V_{GS} = 0V$, $I_D = 1mA$

2N4391 DYNAMIC ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	TYP	MIN	MAX	UNITS	CONDITIONS
g_{fs}	Forward Transconductance	6	--	--	mS	$V_{DS} = 20V$, $I_D = 1mA$, f = 1kHz
g_{os}	Output Conductance	25	--	--	µS	$V_{DS} = 20V$, $I_D = 1mA$, f = 1kHz
$r_{ds(on)}$	Drain to Source On Resistance	--	--	30	Ω	$V_{GS} = 0V$, $I_D = 0A$, f = 1kHz
C_{iss}	Input Capacitance	12	--	14	pF	$V_{DS} = 20V$, $V_{GS} = 0V$, f = 1MHz
C_{rss}	Reverse Transfer Capacitance	3.3	--	--		$V_{DS} = 0V$, $V_{GS} = -5V$, f = 1MHz
C_{rss}		3.2	--	--		$V_{DS} = 0V$, $V_{GS} = -7V$, f = 1MHz
C_{rss}		2.8	--	3.5		$V_{DS} = 0V$, $V_{GS} = -12V$, f = 1MHz
e_n	Equivalent Input Noise Voltage	3	--	--	nV/√Hz	$V_{DS} = 10V$, $I_D = 10mA$, f = 1kHz

2N4391 SWITCHING ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	TYP	MIN	MAX	UNITS	CONDITIONS
$t_{d(on)}$	Turn On Time	2	--	15	ns	$V_{DD} = 10V$, $V_{GS(H)} = 0V$
t_r		2	--	5		
$t_{d(off)}$	Turn Off Time	6	--	20		
t_f		13	--	15		

Notes: 1. Absolute ratings are limiting values above which serviceability may be impaired
2. Pulse test: PW ≤ 300µs, Duty Cycle ≤ 3%

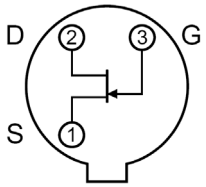
2N4391 SWITCHING CIRCUIT PARAMETERS

$V_{GS(L)}$	-12V
R_L	800Ω
$I_{D(on)}$	12mA

Available Packages:

2N4391 in TO-18
2N4391 in bare die.
Contact Micross for full package and die dimensions

TO-18 (Bottom View)



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SWITCHING CIRCUIT