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## PN4393

### Silicon N-Channel JFET Transistor Chopper, High Speed Switch TO92 Type Package

**Applications:**

- Low Level Analog Switches
- Chopper Stabilized Amplifiers
- Sample and Hold Circuits

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ , Note 1 unless otherwise specified)

Drain-Gate Voltage, $V_{DG}$ .....	30V
Gate-Source Voltage, $V_{GS}$ .....	-30V
Forward Gate Current, $I_{GF}$ .....	50mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	125 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	357 $^\circ\text{C}/\text{W}$

Note 1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired and are based on a maximum junction temperature of  $+150^\circ\text{C}$ .

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = 1\mu\text{A}$ , $V_{DS} = 0$	-30	-	-	V
Gate Reverse Current	$I_{GSS}$	$V_{GS} = -15\text{V}$ , $V_{DS} = 0$	-	-	-1.0	nA
		$V_{GS} = -15\text{V}$ , $V_{DS} = 0$ , $T_A = +150^\circ\text{C}$	-	-	-0.2	$\mu\text{A}$
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 20\text{V}$ , $I_D = 1\text{nA}$	-0.5	-	-3.0	V
Gate-Source Forward Voltage	$V_{GS(f)}$	$V_{DS} = 0$ , $I_G = 1\text{mA}$	-	-	1.0	V
Drain Cutoff Leakage Current	$I_{D(off)}$	$V_{DS} = 20\text{V}$ , $V_{GS} = -5\text{V}$	-	-	0.1	nA
		$V_{DS} = 20\text{V}$ , $V_{GS} = -5\text{V}$ , $T_A = +150^\circ\text{C}$	-	-	0.2	$\mu\text{A}$
<b>ON Characteristics</b>						
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20\text{V}$ , $V_{GS} = 0$ , Note 2	5	-	30	mA
Drain-Source ON Voltage	$V_{DS(on)}$	$I_D = 3\text{mA}$ , $V_{GS} = 0$	-	-	0.4	V
Drain-Source ON Resistance	$r_{DS(on)}$	$I_D = 1\text{mA}$ , $V_{GS} = 0$	-	-	100	$\Omega$

Note 2. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Small-Signal Characteristics</b>						
Drain-Source ON Resistance	$r_{ds(on)}$	$V_{DS} = V_{GS} = 0, f = 1\text{kHz}$	-	-	100	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = 20\text{V}, V_{GS} = 0, f = 1\text{MHz}$	-	-	14	pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{GS} = 5\text{V}, f = 1\text{MHz}$	-	-	3.5	pF
<b>Switching Characteristics</b>						
Rise Time	$t_r$	$I_{D(on)} = 3\text{mA}$	-	-	5	ns
Fall Time	$t_f$	$V_{GS(off)} = 3\text{V}$	-	-	30	ns
Turn-On Time	$t_{on}$	$I_{D(on)} = 3\text{mA}$	-	-	15	ns
Turn-Off Time	$t_{off}$	$V_{GS(off)} = 3\text{V}$	-	-	50	ns

