

## 2N4391, 2N4392, 2N4393

## N-Channel Silicon Junction Field-Effect Transistor

- Low On Resistance Analog Switches
- Choppers
- Commutators

Absolute maximum ratings at  $T_A = 25^\circ\text{C}$ 

Reverse Gate Source & Reverse Gate Drain Voltage	- 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	1.8 W
Power Derating	12 mW/°C

At 25°C free air temperature Static Electrical Characteristics		2N4391		2N4392		2N4393		Process NJ132		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	- 40		- 40		- 40		V	$I_G = -1\mu\text{A}, V_{DS} = \emptyset\text{V}$	
Gate Reverse Current	$I_{GSS}$		- 100		- 100		- 100	pA	$V_{GS} = -20\text{V}, V_{DS} = \emptyset\text{V}$	
			- 200		- 200		- 200	nA	$V_{GS} = -20\text{V}, V_{DS} = \emptyset\text{V}$ $T_A = 150^\circ\text{C}$	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	- 4	- 10	- 2	- 5	- 0.5	- 3	V	$V_{DS} = -20\text{V}, I_D = 1\text{ nA}$	
Gate Source Forward Voltage	$V_{GS(F)}$		1		1		1	V	$I_G = 1\text{ mA}, V_{DS} = \emptyset\text{V}$	
Drain Saturation Current (Pulsed)	$I_{DSS}$	50	150	25	75	5	30	mA	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	
Drain Cutoff Current	$I_{D(OFF)}$						100	pA	$V_{DS} = 20\text{V}, V_{GS} = -5\text{V}$	
							200	nA	$V_{DS} = 20\text{V}, V_{GS} = -5\text{V}$ $T_A = 150^\circ\text{C}$	
					100				pA	$V_{DS} = 20\text{V}, V_{GS} = -7\text{V}$
					200				nA	$V_{DS} = 20\text{V}, V_{GS} = -7\text{V}$ $T_A = 150^\circ\text{C}$
			100						pA	$V_{DS} = 20\text{V}, V_{GS} = -12\text{V}$
	200						nA	$V_{DS} = 20\text{V}, V_{GS} = -12\text{V}$ $T_A = 150^\circ\text{C}$		
Drain Source ON Voltage	$V_{DS(ON)}$						0.4	V	$V_{GS} = \emptyset\text{V}, I_D = 3\text{ mA}$	
					0.4			V	$V_{GS} = \emptyset\text{V}, I_D = 6\text{ mA}$	
			0.4					V	$V_{GS} = \emptyset\text{V}, I_D = 12\text{ mA}$	
Static Drain Source ON Resistance	$r_{DS(ON)}$		30		60		100	$\Omega$	$V_{GS} = \emptyset\text{V}, I_D = 1\text{ mA}$	

## Dynamic Electrical Characteristics

Drain Source ON Resistance	$r_{ds(on)}$		30		60		100	$\Omega$	$V_{GS} = \emptyset\text{V}, I_D = \emptyset\text{A}$	$f = 1\text{ kHz}$
Common Source Input Capacitance	$C_{iss}$		14		14		14	pF	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 1\text{ kHz}$
Common Source Reverse Transfer Capacitance	$C_{rss}$						3.5	pF	$V_{DS} = \emptyset\text{V}, V_{GS} = -5\text{V}$	$f = 1\text{ kHz}$
					3.5			pF	$V_{DS} = \emptyset\text{V}, V_{GS} = -7\text{V}$	$f = 1\text{ kHz}$
			3.5					pF	$V_{DS} = \emptyset\text{V}, V_{GS} = -12\text{V}$	$f = 1\text{ kHz}$

## Switching Characteristics

Turn ON Delay Time	$t_{d(on)}$		15		15		15	ns	$V_{DD} = 10\text{V}, V_{GS(ON)} = \emptyset\text{V}$				
Rise Time	$t_r$		5		5		5	ns	2N4391 2N4392 2N4393				
Turn OFF Delay Time	$t_{d(off)}$		20		35		50	ns	$I_{D(ON)}$	12	6	3	mA
Fall Time	$t_f$		15		20		30	ns	$V_{GS(OFF)}$	- 12	- 7	- 5	V

## TO-18 Package

See Section G for Outline Dimensions

## Pin Configuration

1 Source, 2 Drain, 3 Gate &amp; Case

## Surface Mount

SMP4391, SMP4392, SMP4393