

2N4391-2N4393, ITE4391-ITE4393

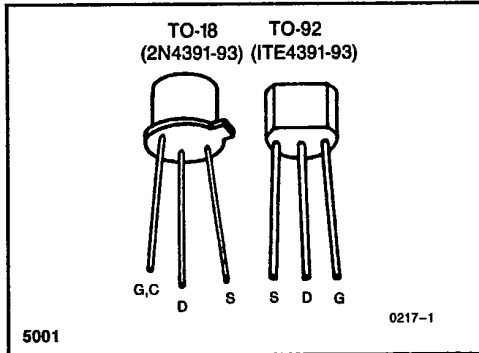
# 2N4391-2N4393, ITE4391-ITE4393 N-Channel JFET Switch



### FEATURES

- $r_{ds(on)} < 300$  Ohms (2N4391)
- $I_{D(OFF)} < 100$  pA
- Switches  $\pm 10$ VAC With  $\pm 15$ V Supplies (2N4392, 2N4393)

### PIN CONFIGURATION



### ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise noted)  
 Gate-Source or Gate-Drain Voltage ..... -40V  
 Gate Current ..... 10mA  
 Storage Temperature Range .....  $-65^\circ\text{C}$  to  $+200^\circ\text{C}$   
 Operating Temperature Range .....  $-55^\circ\text{C}$  to  $+200^\circ\text{C}$   
 Lead Temperature (Soldering, 10sec) .....  $+300^\circ\text{C}$

	TO-18	TO-92
Power Dissipation ..	1.8W	360mW
Derate above $25^\circ\text{C}$	10mW/ $^\circ\text{C}$	3.3mW/ $^\circ\text{C}$

Plastic

Storage .....	$-55^\circ\text{C}$ to $+150^\circ\text{C}$
Operating .....	$-55^\circ\text{C}$ to $+135^\circ\text{C}$

**NOTE:** Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### ORDERING INFORMATION\*

TO-92	TO-18
ITE 4391	2N4391
ITE 4392	2N4392
ITE 4393	2N4393

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	4391		4392		4393		Units
			Min	Max	Min	Max	Min	Max	
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -20\text{V}, V_{DS} = 0$		-100	-100	-100	-100	pA	
			$T_A = 150^\circ\text{C}$	-200	-200	-200	-200	nA	
$BV_{GSS}$	Gate-Source Breakdown Voltage	$I_G = -1\mu\text{A}, V_{DS} = 0$	-40		-40		-40	V	
$I_{D(off)}$	Drain Cutoff Current	$V_{DS} = 20\text{V}$ $V_{GS} = -5\text{V}$ (4393) $V_{GS} = -7\text{V}$ (4392) $V_{GS} = -12\text{V}$ (4391)		100	100	100	100	pA	
			$T_A = 150^\circ\text{C}$	200	200	200	200	nA	
$V_{GS(f)}$	Gate-Source Forward Voltage	$I_G = 1\text{mA}, V_{DS} = 0$		1	1		1	V	
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 20\text{V}, I_D = 1\text{nA}$	-4	-10	-2	-5	-0.5	-3	
$I_{DSS}$	Saturation Drain Current (Note 1)	$V_{DS} = 20\text{V}, V_{GS} = 0$	50	150	25	75	5	30	mA

INTERSIL'S SOLE AND EXCLUSIVE WARRANTY OBLIGATION WITH RESPECT TO THIS PRODUCT SHALL BE THAT STATED IN THE WARRANTY ARTICLE OF THE CONDITION OF SALE. THE WARRANTY SHALL BE EXCLUSIVE AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE.

NOTE: All typical values have been characterized but are not tested.

3875081 G E SOLID STATE

01E 10979 D

**2N4391-2N4393, ITE4391-ITE4393**



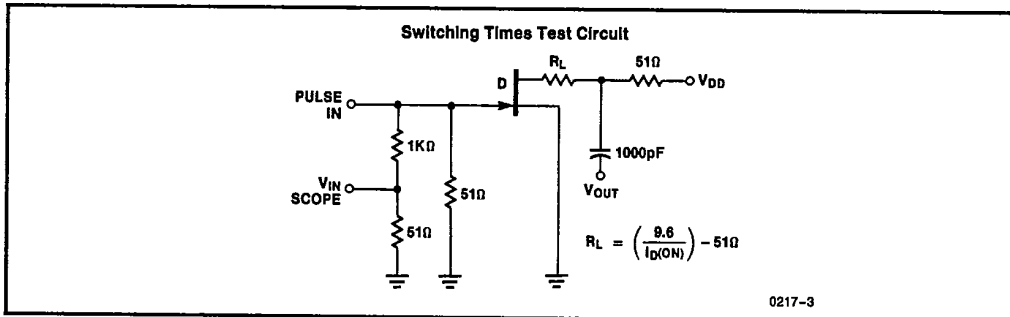
T-35-25

2N4391-2N4393, ITE4391-ITE4393

**ELECTRICAL CHARACTERISTICS** (Continued) ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	4391		4392		4393		Units	
			Min	Max	Min	Max	Min	Max		
$V_{DS(on)}$	Drain-Source ON Voltage	$V_{GS} = 0$ $I_D = 3\text{mA}$ (4393) $I_D = 6\text{mA}$ (4392) $I_D = 12\text{mA}$ (4391)		0.4		0.4		0.4	V	
$r_{DS(on)}$	Static Drain-Source ON Resistance	$V_{GS} = 0, I_D = 1\text{mA}$		30		60		100	$\Omega$	
$r_{ds(on)}$	Drain-Source ON Resistance	$V_{GS} = 0, I_D = 0$	f = 1kHz			30		60	100	
$C_{iss}$	Common-Source Input Capacitance (Note 2)	$V_{DS} = 20\text{V}, V_{GS} = 0$		14		14		14	pF	
$C_{rss}$	Common-Source Reverse Transfer Capacitance (Note 2)	$V_{DS} = 0$	f = 1MHz	$V_{GS} = -5\text{V}$				3.5		
				$V_{GS} = -7\text{V}$			3.5			
				$V_{GS} = -12\text{V}$	3.5					
$t_d$	Turn-ON Delay Time (Note 2)	$V_{DD} = 10\text{V}, V_{GS(on)} = 0$			15		15		ns	
$t_r$	Rise Time (Note 2)	$I_{D(on)}$	$V_{GS(off)}$		5		5			
$t_{off}$	Turn-OFF Delay Time (Note 2)	4391	12mA	-12V		20		35		50
$t_f$	Fall Time (Note 2)	4392	6	-7		15		20		30
		4393	3	-5						

NOTES: 1. Pulse test required, pulse width = 300 $\mu\text{s}$ , duty cycle  $\leq$  3%.  
2. For design reference only, not 100% tested.



10

INTERSIL'S SOLE AND EXCLUSIVE WARRANTY OBLIGATION WITH RESPECT TO THIS PRODUCT SHALL BE THAT STATED IN THE WARRANTY ARTICLE OF THE CONDITION OF SALE. THE WARRANTY SHALL BE EXCLUSIVE AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE.

NOTE: All typical values have been characterized but are not tested.