

2N4391-2N4393, ITE4391-ITE4393

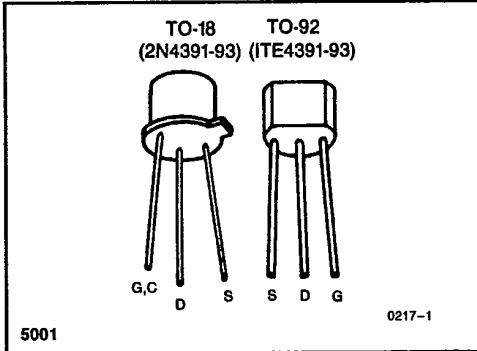
2N4391-2N4393, ITE4391-ITE4393 N-Channel JFET Switch



FEATURES

- $r_{ds(on)} < 300$ Ohms (2N4391)
- $I_{D(OFF)} < 100$ pA
- Switches ± 10 VAC With ± 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°C to $+200^\circ\text{C}$
 Operating Temperature Range -55°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°C | 10mW/ $^\circ\text{C}$ | 3.3mW/ $^\circ\text{C}$ |

Plastic

| | |
|-----------------|---|
| Storage | -55°C to $+150^\circ\text{C}$ |
| Operating | -55°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 |

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

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2N4391-2N4393, ITE4391-ITE4393



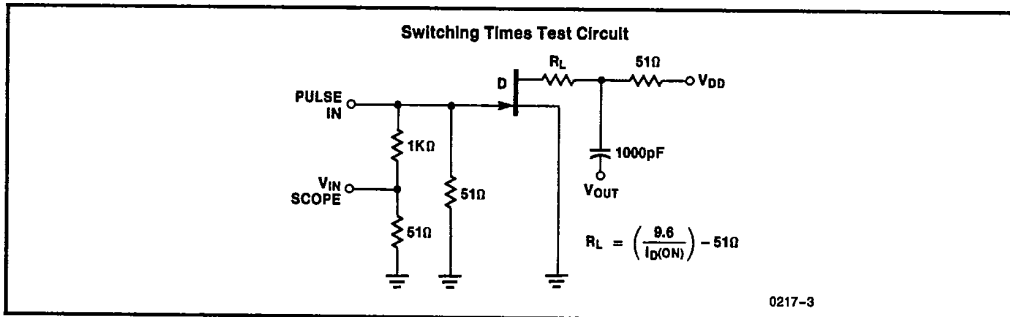
T-35-25

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 | Ω |
| $r_{ds(on)}$ | Drain-Source ON Resistance | $V_{GS} = 0, I_D = 0$ | $f = 1\text{kHz}$ | | | 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) | $V_{DS} = 0$ | $f = 1\text{MHz}$ | $V_{GS} = -5\text{V}$ | | | | 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 | | 15 | ns |
| t_r | Rise Time (Note 2) | | $I_{D(on)}$ | 5 | | 5 | | 5 | |
| t_{off} | Turn-OFF Delay Time (Note 2) | | 4391 12mA | 20 | | 35 | | 50 | |
| t_f | Fall Time (Note 2) | | 4392 6 | 15 | | 20 | | 30 | |
| | | 4393 3 | | | | | | | |

NOTES: 1. Pulse test required, pulse width=300 μs , duty cycle \leq 3%.
2. For design reference only, not 100% tested.



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