2N4091
2N4092
2N4093

JAN, JTX AVAILABLE
CASE 22-03, STYLE 3
TO-18 (TO-206AA)

JFET
SWITCHING

N-CHANNEL — DEPLETION

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	Vdc
Drain-Gate Voltage	V_{DG}	40	Vdc
Gate-Source Voltage	V_{GS}	40	Vdc
Gate Current	I_G	10	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.8 10	Watts mW/°C
Junction Temperature Range	T_J	−65 to +175	°C
Storage Temperature Range	T_{stg}	−65 to +175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Gate-Source Breakdown Voltage (I_G = 1.0 μAdc, V_{DS} = 0)		$V_{(BR)GSS}$	40	—	Vdc
Drain-Gate Breakdown Voltage (I_D = 1.0 μAdc, I_S = 0)		$V_{(BR)DGO}$	40	—	Vdc
Gate Source Cutoff Voltage (V_{DS} = 20 Vdc, I_D = 1.0 nAdc)	 2N4091 2N4092 2N4093	$V_{GS(off)}$	 5.0 2.0 1.0	 10 7.0 5.0	Vdc
Source Reverse Current (V_{SG} = 20 Vdc, I_D = 0)		I_{SGO}	—	0.2	nAdc
Drain Reverse Current (V_{DG} = 20 Vdc, I_S = 0) (V_{DG} = 20 Vdc, I_D = 0, T_A = 150°C)		I_{DGO}	 — —	 0.2 0.4	nAdc μAdc
Drain-Cutoff Current (V_{DS} = 20 Vdc, V_{GS} = 12 Vdc) (V_{DS} = 20 Vdc, V_{GS} = 8.0 Vdc) (V_{DS} = 20 Vdc, V_{GS} = 6.0 Vdc) (V_{DS} = 20 Vdc, V_{GS} = 12 Vdc, T_A = 150°C) (V_{DS} = 20 Vdc, V_{GS} = 8.0 Vdc, T_A = 150°C) (V_{DS} = 20 Vdc, V_{GS} = 6.0 Vdc, T_A = 150°C)	 2N4091 2N4092 2N4093 2N4091 2N4092 2N4093	$I_{D(off)}$	 — — — — — —	 0.2 0.2 0.2 0.4 0.4 0.4	 nAdc μAdc
ON CHARACTERISTICS					
Zero-Gate-Voltage Drain Current* (V_{DS} = 20 Vdc, V_{GS} = 0)	 2N4091 2N4092 2N4093	I_{DSS}*	 30 15 8.0	 — — —	mAdc
Drain-Source On-Voltage (I_D = 6.6 mAdc, V_{GS} = 0) (I_D = 4.0 mAdc, V_{GS} = 0) (I_D = 2.5 mAdc, V_{GS} = 0)	 2N4091 2N4092 2N4093	$V_{DS(on)}$	 — — —	 0.2 0.2 0.2	Vdc
Static Drain-Source On Resistance (I_D = 1.0 mAdc, V_{GS} = 0)	 2N4091 2N4092 2N4093	$r_{DS(on)}$	 — — —	 30 50 80	Ohms

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
SMALL-SIGNAL CHARACTERISTICS					
Drain-Source "ON" Resistance (V_{GS} = 0, I_D = 0, f = 1.0 kHz)	2N4091	$r_{ds(on)}$	—	30	Ohms
	2N4092		—	50	
	2N4093		—	80	
Input Capacitance (V_{DS} = 20 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	—	16	pF
Reverse Transfer Capacitance (V_{DS} = 0, V_{GS} = 20 Vdc, f = 1.0 MHz)		C_{rss}	—	5.0	pF
SWITCHING CHARACTERISTICS					
Delay Time (See Figure 1)		t_d			ns
($I_{D(on)}$ = 6.6 mAdc)	2N4091		—	15	
($I_{D(on)}$ = 4.0 mAdc)	2N4092		—	15	
($I_{D(on)}$ = 2.5 mAdc)	2N4093		—	20	
Rise Time (See Figure 1)		t_r			ns
($I_{D(on)}$ = 6.6 mAdc)	2N4091		—	10	
($I_{D(on)}$ = 4.0 mAdc)	2N4092		—	20	
($I_{D(on)}$ = 2.5 mAdc)	2N4093		—	40	
Turn-Off Time (See Figure 1)		t_{off}			ns
($V_{GS(off)}$ = 12 Vdc)	2N4091		—	40	
($V_{GS(off)}$ = 8.0 Vdc)	2N4092		—	60	
($V_{GS(off)}$ = 6.0 Vdc)	2N4093		—	80	

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 3.0%.

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FIGURE 1 – SWITCHING TIMES TEST CIRCUIT