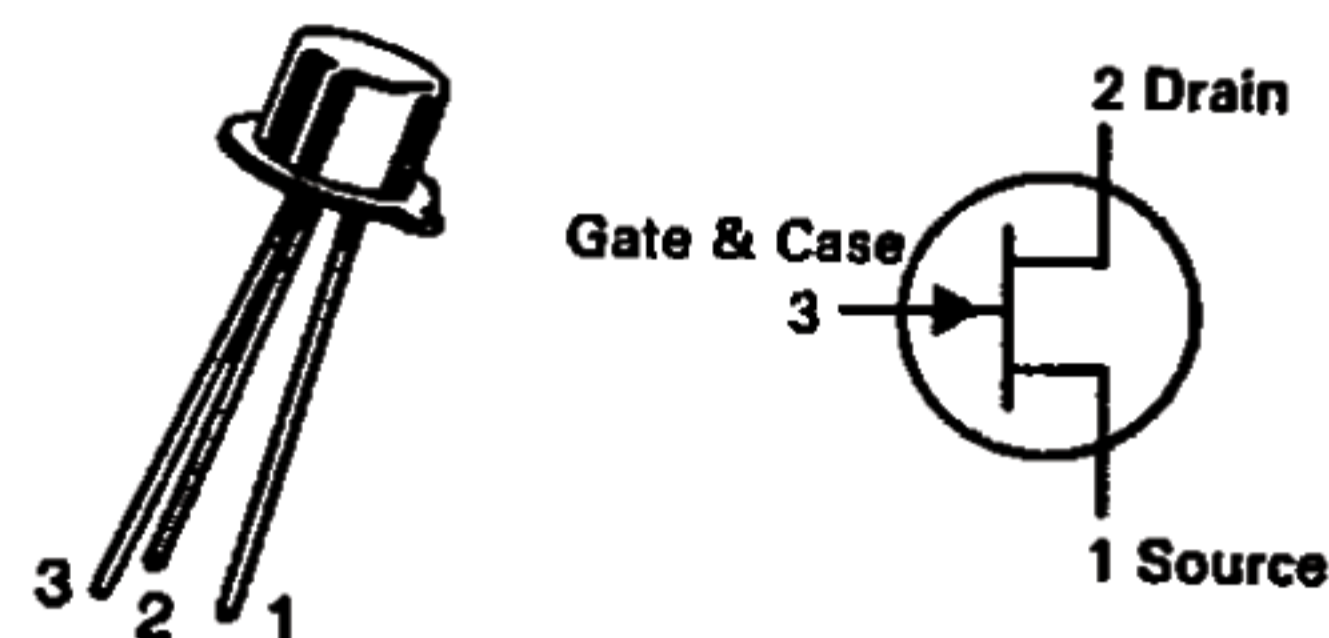


2N4856, A thru 2N4861, A

2N4856, 2N4857, 2N4858
JAN, JTX, JTXV AVAILABLE

CASE 22-03, STYLE 4
TO-18 (TO-206AA)



**JFET
SWITCHING**

N-CHANNEL — DEPLETION

MAXIMUM RATINGS

Rating	Symbol	2N4856,A 2N4857,A 2N4858,A	2N4859,A 2N4860,A 2N4861,A	Unit
Drain-Source Voltage	V _{DS}	+40	+30	Vdc
Drain-Gate Voltage	V _{DG}	+40	+30	Vdc
Reverse Gate-Source Voltage	V _{GSR}	-40	-30	Vdc
Forward Gate Current	I _{GF}	50		mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	360 2.4		mW mW/°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 -30	—	Vdc
Gate Reverse Current (V _{GS} = -20 Vdc, V _{DS} = 0)	I _{GSS}	—	0.25	nAdc
(V _{GS} = -15 Vdc, V _{DS} = 0)		—	0.25	μAdc
(V _{GS} = -20 Vdc, V _{DS} = 0, T _A = 150°C)		—	0.5	μAdc
(V _{GS} = -15 Vdc, V _{DS} = 0, T _A = 150°C)		—	0.5	μAdc
Gate Source Cutoff Voltage (V _{DS} = 15 Vdc, I _D = 0.5 nAdc)	V _{GS(off)}	-4.0 -2.0 -0.8	-10 -6.0 -4.0	Vdc
Drain Cutoff Current (V _{DS} = 15 Vdc, V _{GS} = -10 Vdc)	I _{D(off)}	—	0.25	nAdc
(V _{DS} = 15 Vdc, V _{GS} = -10 Vdc, T _A = 150°C)		—	0.5	μAdc
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current(1) (V _{DS} = 15 Vdc, V _{GS} = 0)	I _{DSS}	50 20 8.0	— 100 80	mAdc
Drain-Source On-Voltage (I _D = 20 mAdc, V _{GS} = 0)	V _{DS(on)}	—	0.75	Vdc
(I _D = 10 mAdc, V _{GS} = 0)		—	0.5	
(I _D = 5.0 mAdc, V _{GS} = 0)		—	0.5	
SMALL-SIGNAL CHARACTERISTICS				
Drain-Source "ON" Resistance (V _{GS} = 0, I _D = 0, f = 1.0 kHz)	r _{ds(on)}	—	25 40 60	Ohms
Input Capacitance (V _{DS} = 0, V _{GS} = -10 Vdc, f = 1.0 MHz)	C _{iss}	—	18 10	pF
Reverse Transfer Capacitance (V _{DS} = 0, V _{GS} = -10 Vdc, f = 1.0 MHz)	C _{rss}	—	8.0 4.0 3.5	pF

2N4856, A thru 2N4861, A

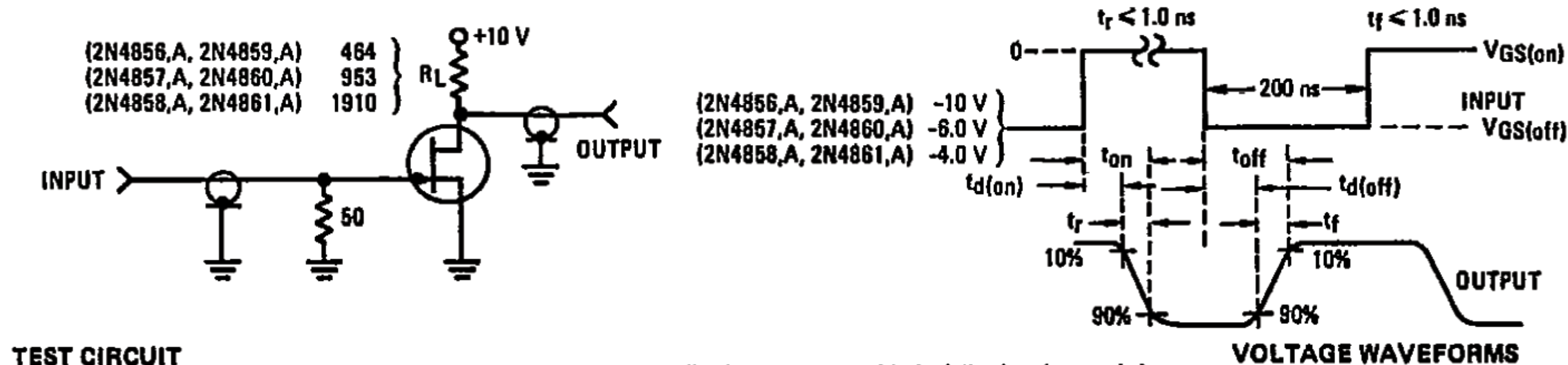
ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit				
SWITCHING CHARACTERISTICS (See Figure 1) (2)								
Turn-On Delay Time	Conditions for 2N4856,A, 2N4859,A: 2N4856, 2N4859 2N4856A, 2N4859A 2N4857, 2N4860 2N4857A, 2N4860A 2N4858, 2N4861 2N4858A, 2N4861A (V _{DD} = 10 Vdc, I _{D(on)} = 20 mAdc, V _{GS(on)} = 0, V _{GS(off)} = -10 Vdc)	t _{d(on)}	—	6.0	ns			
Rise Time			Conditions for 2N4857,A, 2N4860,A: 2N4856,A, 2N4859,A 2N4857,A, 2N4860,A 2N4858, 2N4861 2N4858A, 2N4861A (V _{DD} = 10 Vdc, I _{D(on)} = 10 mAdc, V _{GS(on)} = 0, V _{GS(off)} = -6.0 Vdc)	t _r		—	3.0	ns
Turn-Off Time						Conditions for 2N4858,A, 2N4861,A: 2N4856, 2N4859 2N4856A, 2N4859A 2N4857, 2N4860 2N4857A, 2N4860A 2N4858, 2N4861 2N4858A; 2N4861A (V _{DD} = 10 Vdc, I _{D(on)} = 5.0 mAdc, V _{GS(on)} = 0, V _{GS(off)} = -4.0 Vdc)	t _{off}	
	—	20						
	—	50						
		—	40					
		—	100					
		—	80					

(1) Pulse Test: Pulse Width = 100 ms, Duty Cycle ≤ 10%.

(2) The I_{D(on)} values are nominal; exact values vary slightly with transistor parameters.

FIGURE 1 — SWITCHING TIMES TEST CIRCUIT



NOTES: a. The input waveforms are supplied by a generator with the following characteristics:
 Z_{out} = 50 ohms, Duty Cycle ≈ 2.0%.
 b. Waveforms are monitored on an oscilloscope with the following characteristics:
 t_r < 0.75 ns, R_{in} > 1.0 megohm, C_{in} < 2.5 pF.