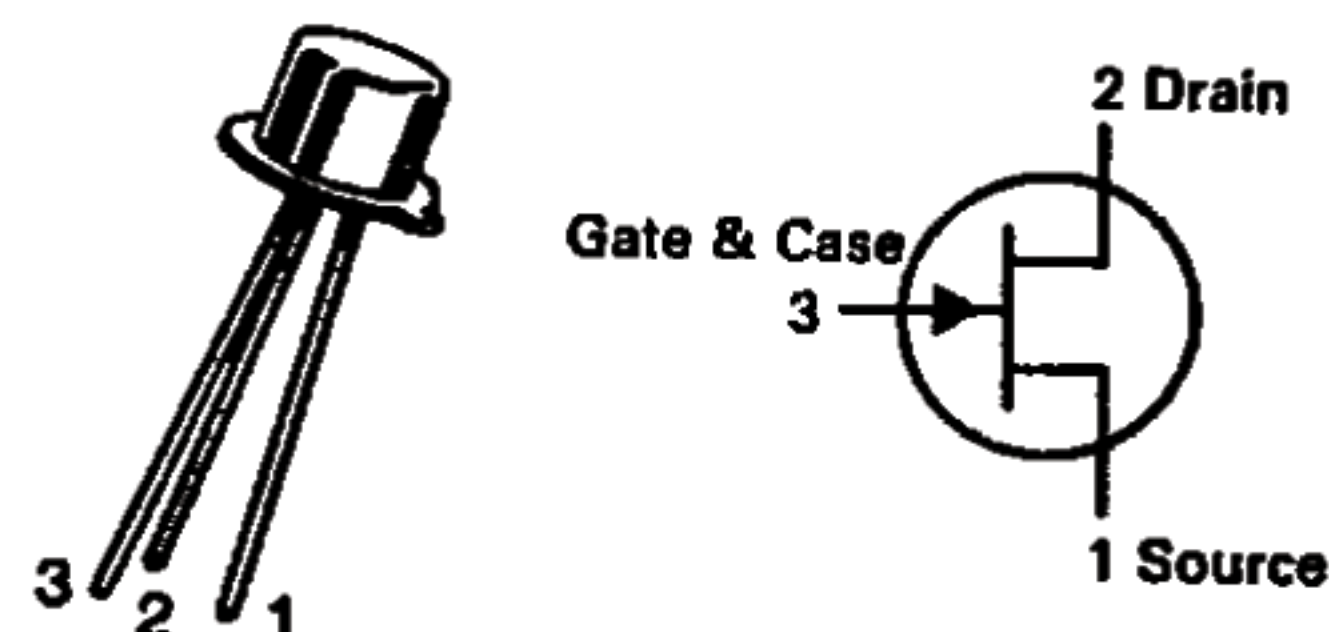


2N4856, A thru 2N4861, A

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 @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	360 2.4		mW mW/°C
Storage Temperature Range	T_{stg}	-65 to +175		°C

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Gate-Source Breakdown Voltage ($I_G = 1.0 \mu\text{Adc}$, $V_{DS} = 0$)	2N4856,A, 2N4857,A, 2N4858,A 2N4859,A, 2N4860,A, 2N4861,A	$V_{(BR)GSS}$	-40 -30	— —	Vdc
Gate Reverse Current ($V_{GS} = -20 \text{ Vdc}$, $V_{DS} = 0$)	2N4856,A 2N4857,A, 2N4858,A 2N4859,A, 2N4860,A, 2N4861,A	I_{GSS}	—	0.25	nAdc
($V_{GS} = -15 \text{ Vdc}$, $V_{DS} = 0$)			—	0.25	μAdc
($V_{GS} = -20 \text{ Vdc}$, $V_{DS} = 0$, $T_A = 150^\circ\text{C}$)	2N4856,A, 2N4857,A, 2N4858,A 2N4859,A, 2N4860,A, 2N4861,A		—	0.5	μAdc
($V_{GS} = -15 \text{ Vdc}$, $V_{DS} = 0$, $T_A = 150^\circ\text{C}$)			—	0.5	μAdc
Gate Source Cutoff Voltage ($V_{DS} = 15 \text{ Vdc}$, $I_D = 0.5 \text{ nAdc}$)	2N4856,A, 2N4859,A 2N4857,A, 2N4860,A 2N4858,A, 2N4861,A	$V_{GS(off)}$	-4.0 -2.0 -0.8	-10 -6.0 -4.0	Vdc
Drain Cutoff Current ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = -10 \text{ Vdc}$)		$I_{D(off)}$	—	0.25	nAdc
($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = -10 \text{ Vdc}$, $T_A = 150^\circ\text{C}$)			—	0.5	μAdc

ON CHARACTERISTICS

Zero-Gate-Voltage Drain Current(1) ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$)	2N4856,A, 2N4859,A 2N4857,A, 2N4860,A 2N4858,A, 2N4861,A	I_{DSS}	50 20 8.0	— 100 80	mAdc
Drain-Source On-Voltage ($I_D = 20 \text{ mAdc}$, $V_{GS} = 0$)	2N4856,A, 2N4859,A	$V_{DS(on)}$	—	0.75	Vdc
($I_D = 10 \text{ mAdc}$, $V_{GS} = 0$)	2N4857,A, 2N4860,A		—	0.5	
($I_D = 5.0 \text{ mAdc}$, $V_{GS} = 0$)	2N4858,A, 2N4861,A		—	0.5	

SMALL-SIGNAL CHARACTERISTICS

Drain-Source "ON" Resistance ($V_{GS} = 0$, $I_D = 0$, $f = 1.0 \text{ kHz}$)	2N4856,A, 2N4859,A 2N4857,A, 2N4860,A 2N4858,A, 2N4861,A	$r_{ds(on)}$	— — —	25 40 60	Ohms
Input Capacitance ($V_{DS} = 0$, $V_{GS} = -10 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	2N4856 thru 2N4861 2N4856A thru 2N4861A	C_{iss}	— —	18 10	pF
Reverse Transfer Capacitance ($V_{DS} = 0$, $V_{GS} = -10 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	2N4856 thru 2N4861 2N4856A, 2N4859A 2N4857A, 2N4858A, 2N4860A, 2N4861A	C_{rss}	— — —	8.0 4.0 3.5	pF

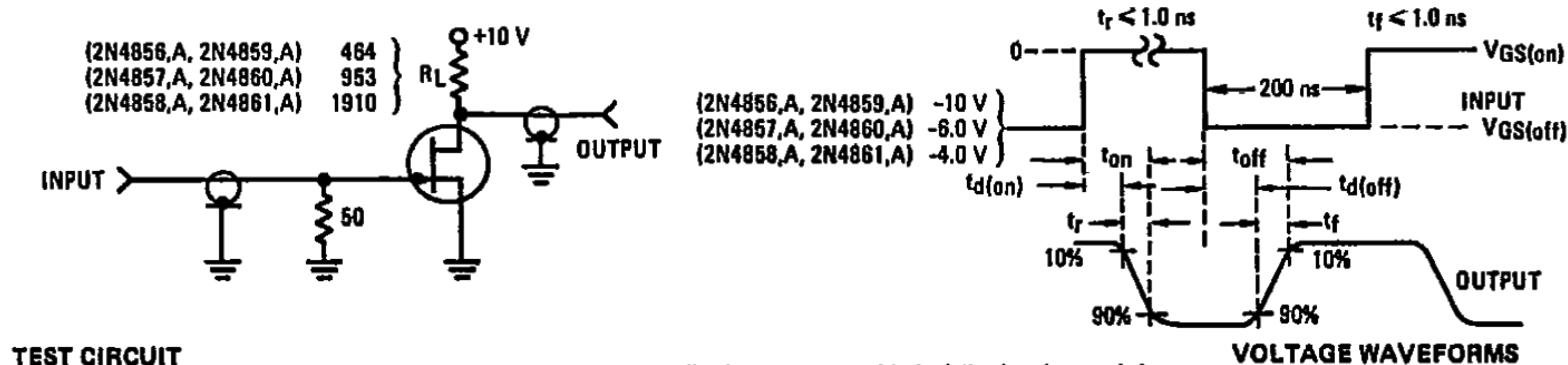
2N4856, A thru 2N4861, A

ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS (See Figure 1) (2)				
Turn-On Delay Time	$t_{d(on)}$	—	6.0	ns
Rise Time	t_r	—	3.0	ns
		—	4.0	ns
		—	10	ns
		—	8.0	ns
Turn-Off Time	t_{off}	—	25	ns
		—	20	ns
		—	50	ns
		—	40	ns
		—	100	ns
		—	80	ns

(1) Pulse Test: Pulse Width = 100 ms, Duty Cycle $\leq 10\%$.(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:
 $Z_{out} = 50 \text{ ohms}$, Duty Cycle $\approx 2.0\%$.

b. Waveforms are monitored on an oscilloscope with the following characteristics:
 $t_r < 0.75 \text{ ns}$, $R_{in} > 1.0 \text{ megohm}$, $C_{in} < 2.5 \text{ pF}$.