

2N5653 2N5654

CASE 29-02, STYLE 5
TO-92 (TO-226AA)

JFET
SWITCHING

N-CHANNEL — DEPLETION

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Gate Voltage	V _{DG}	30	Vdc
Reverse Gate-Source Voltage	V _{GSR}	30	Vdc
Forward Gate Current	I _{GF}	10	mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	310 2.82	mW mW/°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Gate-Source Breakdown Voltage (I _G = 10 μAdc, V _{DS} = 0)	V _{(BR)GSS}	30	—	Vdc
Gate Reverse Current (V _{GS} = -15 Vdc, V _{DS} = 0) (V _{GS} = -15 Vdc, V _{DS} = 0, T _A = 100°C)	I _{GSS}	—	1.0	nAdc μAdc
Drain Cutoff Current (V _{DS} = 15 Vdc, V _{GS} = -12 Vdc) (V _{DS} = 15 Vdc, V _{GS} = -8.0 Vdc) (V _{DS} = 15 Vdc, V _{GS} = -12 Vdc, T _A = 100°C) (V _{DS} = 15 Vdc, V _{GS} = -8.0 Vdc, T _A = 100°C)	I _{D(off)}	—	1.0	nAdc μAdc
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current(1) (V _{DS} = 20 Vdc, V _{GS} = 0)	I _{DSS}	40 15	—	mAdc
Drain-Source On-Voltage (I _D = 10 mAdc, V _{GS} = 0) (I _D = 5.0 mAdc, V _{GS} = 0)	V _{DS(on)}	—	0.75 0.75	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Static Drain-Source "ON" Resistance (V _{GS} = 0, I _D = 1.0 mAdc) (V _{GS} = 0, I _D = 0, f = 1.0 kHz)	r _{ds(on)}	—	50 100 50 100	Ohms
Input Capacitance (V _{DS} = 0, V _{GS} = -12 Vdc, f = 1.0 MHz)	C _{iss}	—	10	pF
Reverse Transfer Capacitance (V _{DS} = 0, V _{GS} = -12 Vdc, f = 1.0 MHz) (V _{DS} = 0, V _{GS} = -8.0 Vdc, f = 1.0 MHz)	C _{rss}	—	3.5 3.5	pF

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

Characteristic	Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS				
Turn-On Delay Time	$t_{d(on)}$	—	4.0	ns
Rise Time			6.0	
Turn-Off Delay Time	$t_{d(off)}$	—	5.0	ns
			10	
Fall Time	t_f	—	10	ns
			20	

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 3.0\%$.

FIGURE 1 – SWITCHING TIME TEST CIRCUIT

