

2N5653
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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	V _{dc}
Reverse Gate-Source Voltage	V _{GSR}	30	V _{dc}
Forward Gate Current	I _{GF}	10	mA _{dc}
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
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OFF CHARACTERISTICS				
Gate-Source Breakdown Voltage (I _G = 10 μA _{dc} , V _{DS} = 0)	V _{(BR)GSS}	30	—	V _{dc}
Gate Reverse Current (V _{GS} = -15 V _{dc} , V _{DS} = 0) (V _{GS} = -15 V _{dc} , V _{DS} = 0, T _A = 100°C)	I _{GSS}	—	1.0 1.0	nA _{dc} μA _{dc}
Drain Cutoff Current (V _{DS} = 15 V _{dc} , V _{GS} = -12 V _{dc}) (V _{DS} = 15 V _{dc} , V _{GS} = -8.0 V _{dc}) (V _{DS} = 15 V _{dc} , V _{GS} = -12 V _{dc} , T _A = 100°C) (V _{DS} = 15 V _{dc} , V _{GS} = -8.0 V _{dc} , T _A = 100°C)	I _{D(off)}	—	1.0 1.0 1.0 1.0	nA _{dc} μA _{dc}

ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current(1) (V _{DS} = 20 V _{dc} , V _{GS} = 0)	I _{DSS}	40 15	—	mA _{dc}
Drain-Source On-Voltage (I _D = 10 mA _{dc} , V _{GS} = 0) (I _D = 5.0 mA _{dc} , V _{GS} = 0)	V _{DS(on)}	—	0.75 0.75	V _{dc}

SMALL-SIGNAL CHARACTERISTICS				
Static Drain-Source "ON" Resistance (V _{GS} = 0, I _D = 1.0 mA _{dc})	r _{ds(on)}	—	50 100	Ohms
(V _{GS} = 0, I _D = 0, f = 1.0 kHz)		—	50 100	
Input Capacitance (V _{DS} = 0, V _{GS} = -12 V _{dc} , f = 1.0 MHz)	C _{iss}	—	10	pF
Reverse Transfer Capacitance (V _{DS} = 0, V _{GS} = -12 V _{dc} , f = 1.0 MHz) (V _{DS} = 0, V _{GS} = -8.0 V _{dc} , f = 1.0 MHz)	C _{res}	—	3.5 3.5	pF

SWITCHING CHARACTERISTICS						
Turn-On Delay Time	Test Condition for 2N5653: (V _{DD} = 10 V _{dc} , V _{GS(on)} = 0, V _{GS(off)} = -12 V _{dc} , I _{D(on)} = 10 mA _{dc} , R _{G'} = 50 Ohms)	2N5653 2N5654	t _{d(on)}	— —	4.9 6.9	ns
Rise Time		2N5653 2N5654	t _r	— —	5.9 8.0	ns
Turn-Off Delay Time	Test Condition for 2N5654: (V _{DD} = 10 V _{dc} , V _{GS(on)} = 0, V _{GS(off)} = -12 V _{dc} , I _{D(on)} = 5.0 mA _{dc} , R _{G'} = 50 Ohms (Figure 1)	2N5653 2N5654	t _{d(off)}	— —	5.0 10	ns
Fall Time		2N5653 2N5654	t _f	— —	10 20	ns

(1) Pulse Test: Pulse Width < 300 μs, Duty Cycle < 3.0%.

