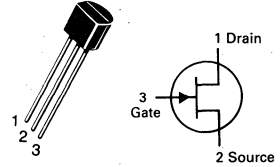


# 2N5638 thru 2N5640

CASE 29-04, STYLE 5  
TO-92 (TO-226AA)



**JFETs  
SWITCHING**

**N-CHANNEL — DEPLETION**

Refer to MPF4391 for graphs.

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	Vdc
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 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/°C
Junction Temperature Range	$T_J$	-65 to +150	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Gate-Source Breakdown Voltage ( $I_G = 10 \mu\text{Adc}$ , $V_{DS} = 0$ )	$V_{(BR)GSS}$	30	—	Vdc
Gate Reverse Current ( $V_{GS} = -15 \text{ Vdc}$ , $V_{DS} = 0$ ) ( $V_{GS} = -15 \text{ Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ )	$I_{GSS}$	— —	1.0 1.0	nAdc $\mu\text{Adc}$
Drain Cutoff Current ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -12 \text{ Vdc}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -8.0 \text{ Vdc}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -6.0 \text{ Vdc}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -12 \text{ Vdc}$ , $T_A = 100^\circ\text{C}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -8.0 \text{ Vdc}$ , $T_A = 100^\circ\text{C}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = -6.0 \text{ Vdc}$ , $T_A = 100^\circ\text{C}$ )	$I_{D(off)}$	— — — — — —	1.0 1.0 1.0 1.0 1.0 1.0	nAdc $\mu\text{Adc}$
<b>ON CHARACTERISTICS</b>				
Zero-Gate-Voltage Drain Current(1) ( $V_{DS} = 20 \text{ Vdc}$ , $V_{GS} = 0$ )	$I_{DSS}$	50 25 5.0	— — —	mAdc
Drain-Source On-Voltage ( $I_D = 12 \text{ mAdc}$ , $V_{GS} = 0$ ) ( $I_D = 6.0 \text{ mAdc}$ , $V_{GS} = 0$ ) ( $I_D = 3.0 \text{ mAdc}$ , $V_{GS} = 0$ )	$V_{DS(on)}$	— — —	0.5 0.5 0.5	Vdc
Static Drain-Source On Resistance ( $I_D = 1.0 \text{ mAdc}$ , $V_{GS} = 0$ )	$r_{DS(on)}$	— — —	30 60 100	Ohms
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Static Drain-Source "ON" Resistance ( $V_{GS} = 0$ , $I_D = 0$ , $f = 1.0 \text{ kHz}$ )	$r_{ds(on)}$	— — —	30 60 100	Ohms
Input Capacitance ( $V_{DS} = 0$ , $V_{GS} = -12 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$C_{iss}$	—	10	pF
Reverse Transfer Capacitance ( $V_{DS} = 0$ , $V_{GS} = -12 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$C_{rss}$	—	4.0	pF

## 2N5638 thru 2N5640

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

Characteristic		Symbol	Min	Max	Unit	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time		$I_{D(on)} = 12 \text{ mAdc}$ 2N5638	$t_{d(on)}$	—	4.0	ns
		6.0 mAdc 2N5639		—	6.0	
		3.0 mAdc 2N5640		—	8.0	
Rise Time	$V_{DD} = 10 \text{ Vdc}$ , $V_{GS(on)} = 0$ ,	$I_{D(on)} = 12 \text{ mAdc}$ 2N5638	$t_r$	—	5.0	ns
		6.0 mAdc 2N5639		—	8.0	
		3.0 mAdc 2N5640		—	10	
Turn-Off Delay Time	$V_{GS(off)} = -10 \text{ Vdc}$ , $R_{G'} = 50 \text{ ohms}$	$I_{D(on)} = 12 \text{ mAdc}$ 2N5638	$t_{d(off)}$	—	5.0	ns
		6.0 mAdc 2N5639		—	10	
		3.0 mAdc 2N5640		—	15	
Fall Time		$I_{D(on)} = 12 \text{ mAdc}$ 2N5638	$t_f$	—	10	ns
		6.0 mAdc 2N5639		—	20	
		3.0 mAdc 2N5640		—	30	

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