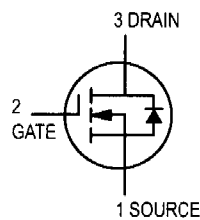
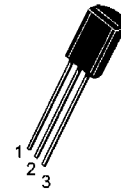


TMOS Switching

N-Channel — Enhancement



MPF930
MPF960
MPF990



TO-92 (TO-226AE)

MAXIMUM RATINGS

Rating	Symbol	MPF930	MPF960	MPF990	Unit
Drain-Source Voltage	V_{DS}	35	60	90	Vdc
Drain-Gate Voltage	V_{DG}	35	60	90	Vdc
Gate-Source Voltage — Continuous — Non-repetitive ($t_p \leq 50 \mu s$)	V_{GS} V_{GSM}		± 20 ± 40		Vdc Vpk
Drain Current Continuous(1) Pulsed(2)	I_D I_{DM}		2.0 3.0		Adc
Total Device Dissipation @ $T_A = 25^\circ C$ Derate above $25^\circ C$	P_D		1.0 8.0		Watts mW/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{stg}		-55 to 150		$^\circ C$
Thermal Resistance	θ_{JA}		125		$^\circ C/W$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

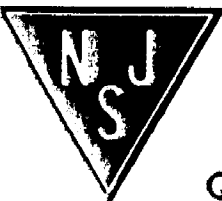
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu A_{dc}$)	$V_{(BR)DSX}$	35 60 90	— — —	— — —	Vdc
Gate Reverse Current ($V_{GS} = 15 V_{dc}, V_{DS} = 0$)	I_{GSS}	—	—	50	nAdc

ON CHARACTERISTICS(2)

Zero-Gate-Voltage Drain Current ($V_{DS} = \text{Maximum Rating}, V_{GS} = 0$)	I_{DSS}	—	—	10	μA_{dc}
Gate Threshold Voltage ($I_D = 1.0 \text{ mAdc}, V_{DS} = V_{GS}$)	$V_{GS(Th)}$	1.0	—	3.5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10 V_{dc}$) ($I_D = 0.5 \text{ Adc}$)	$V_{DS(on)}$	MPF930 MPF960 MPF990	— — —	0.4 0.6 0.6	0.7 0.8 1.2
($I_D = 1.0 \text{ Adc}$)		MPF930 MPF960 MPF990	— — —	0.9 1.2 1.2	1.4 1.7 2.4
($I_D = 2.0 \text{ Adc}$)		MPF930 MPF960 MPF990	— — —	2.2 2.8 2.8	3.0 3.5 4.8

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2.0\%$.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



MPF930 MPF960 MPF990

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS⁽²⁾ (Continued)					
Static Drain-Source On Resistance ($V_{GS} = 10\text{ Vdc}$, $I_D = 1.0\text{ Adc}$)	$r_{DS(on)}$	—	0.9	1.4	Ω
			1.2	1.7	
			1.2	2.0	
On-State Drain Current ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 10\text{ Vdc}$)	$I_{D(on)}$	1.0	2.0	—	Amps

SMALL-SIGNAL CHARACTERISTICS

Input Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{iss}	—	70	—	pF
Reverse Transfer Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{rss}	—	20	—	pF
Output Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{oss}	—	49	—	pF
Forward Transconductance ($V_{DS} = 25\text{ Vdc}$, $I_D = 0.5\text{ Adc}$)	g_{fs}	200	380	—	mmhos

SWITCHING CHARACTERISTICS

Turn-On Time	t_{on}	—	7.0	15	ns
Turn-Off Time	t_{off}	—	7.0	15	ns

2. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

RESISTIVE SWITCHING

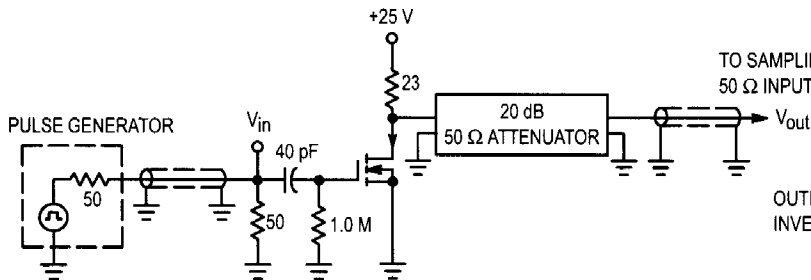


Figure 1. Switching Test Circuit

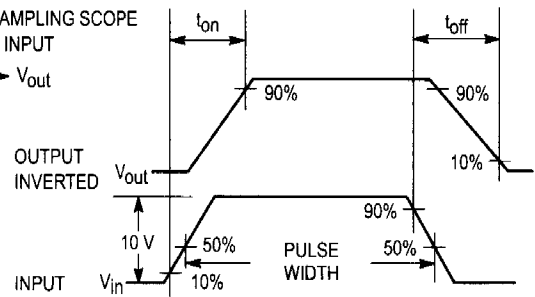


Figure 2. Switching Waveforms