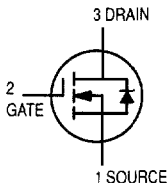


TMOS Switching

N-Channel — Enhancement



MPF930
MPF960
MPF990



CASE 29-05, STYLE 22
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 ($V_{GS} = 0, I_D = 10 \mu A_{dc}$)	MPF930 MPF960 MPF990	$V_{(BR)DSX}$	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 ($I_D = 1.0 \text{ mA}_{dc}, V_{DS} = V_{GS}$)		$V_{GS(Th)}$	1.0	—	3.5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10 V_{dc}$)	MPF930 MPF960 MPF990	$V_{DS(on)}$	— — —	0.4 0.6 0.6	0.7 0.8 1.2	Vdc
($I_D = 0.5 \text{ Adc}$)						
($I_D = 1.0 \text{ Adc}$)	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	

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

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 $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

RESISTIVE SWITCHING

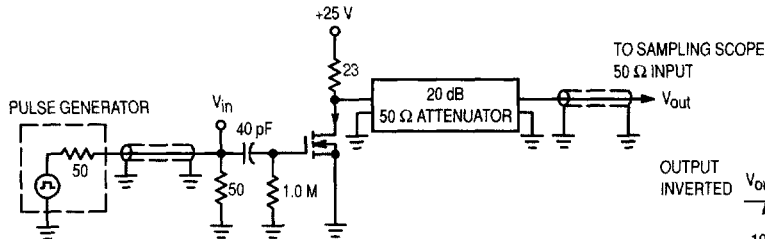


Figure 1. Switching Test Circuit

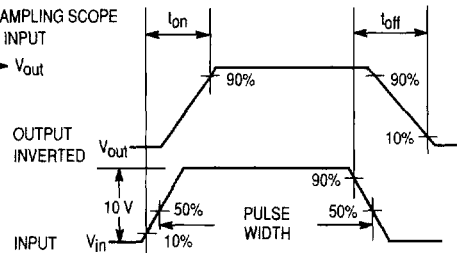


Figure 2. Switching Waveforms

MPF930 MPF960 MPF990

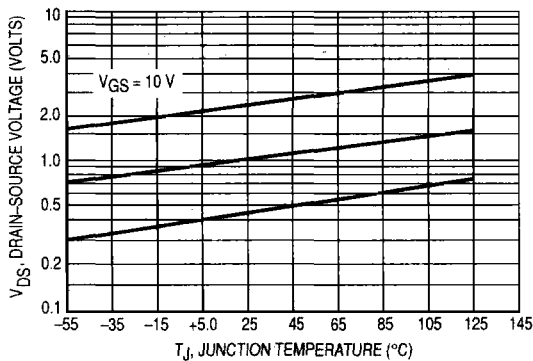


Figure 3. On Voltage versus Temperature

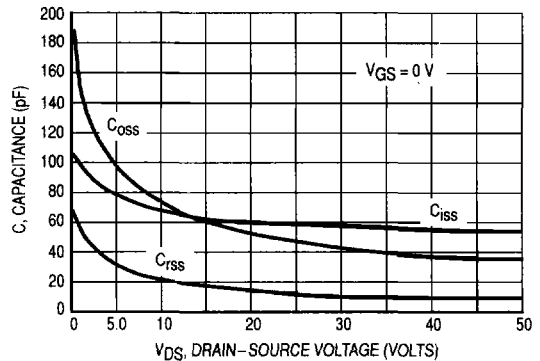


Figure 4. Capacitance Variation

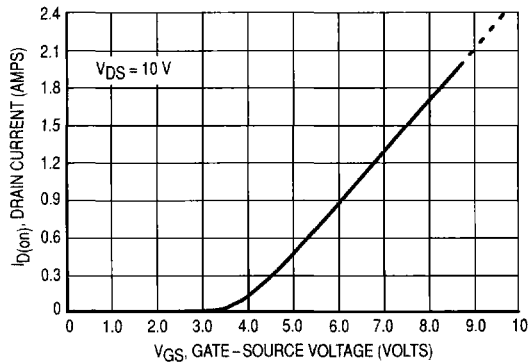


Figure 5. Transfer Characteristic

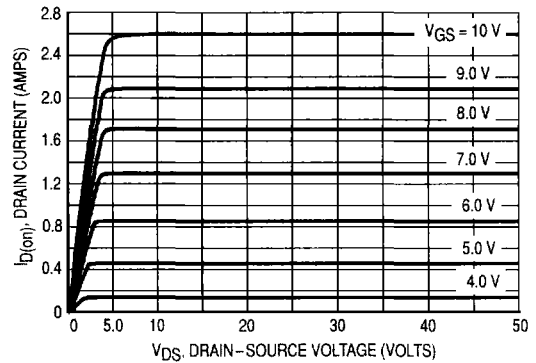


Figure 6. Output Characteristic

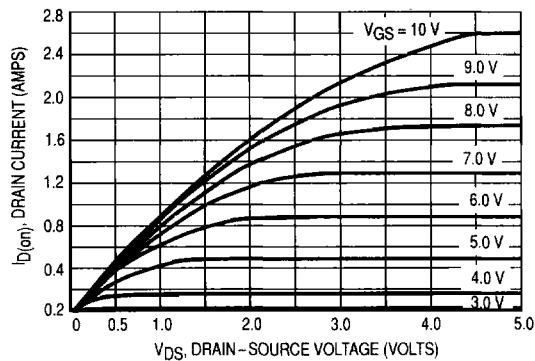


Figure 7. Saturation Characteristic