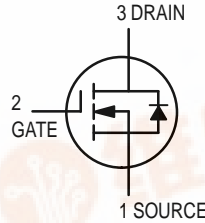
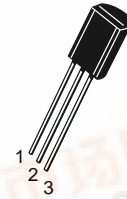


TMOS Switching

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	V_{GS}				Vdc
— Continuous	V_{GSM}				± 20
Drain Current	I_D				Adc
Continuous(1)	I_{DM}				
Total Device Dissipation	P_D				Watts mW/°C
@ $T_A = 25^\circ\text{C}$ Derate above 25°C					
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150			°C
Thermal Resistance	θ_{JA}	125			°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu\text{Adc}$)	$V_{(BR)DSX}$	MPF930 35 MPF960 60 MPF990 90	— — —	— — —	Vdc
Gate Reverse Current ($V_{GS} = 15 \text{Vdc}, V_{DS} = 0$)	I_{GSS}	—	—	50	nAdc

ON CHARACTERISTICS(2)

Zero-Gate-Voltage Drain Current ($V_{DS} = \text{Maximum Rating}, V_{GS} = 0$)	I_{DSS}	—	—	10	μAdc
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 ($V_{GS} = 10 \text{Vdc}$) ($I_D = 0.5 \text{Adc}$)	$V_{DS(on)}$	MPF930 — MPF960 — MPF990 —	0.4 0.6 0.6	0.7 0.8 1.2	Vdc
($I_D = 1.0 \text{Adc}$)		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 $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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
	MPF930	—	1.2	1.7	
	MPF960	—	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

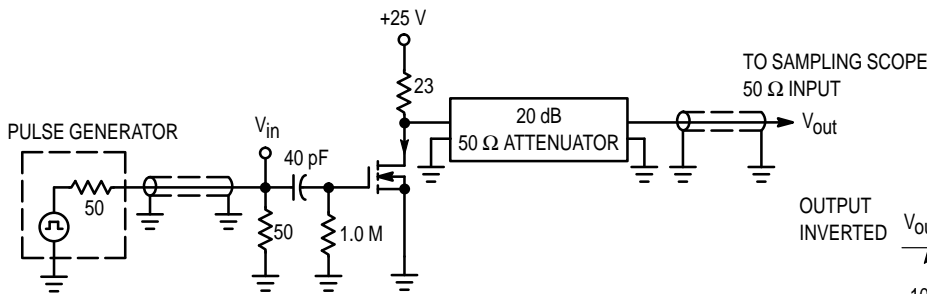


Figure 1. Switching Test Circuit

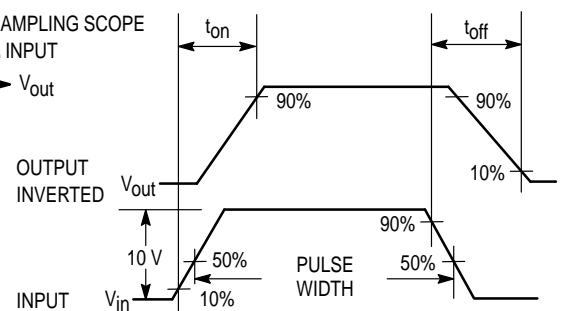


Figure 2. Switching Waveforms

MPF930 MPF960 MPF990

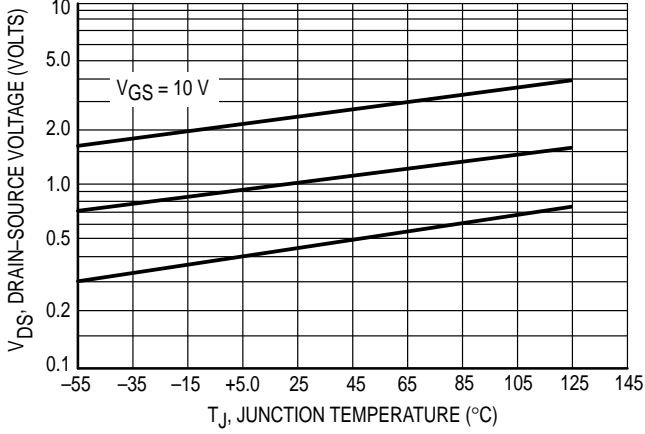


Figure 3. On Voltage versus Temperature

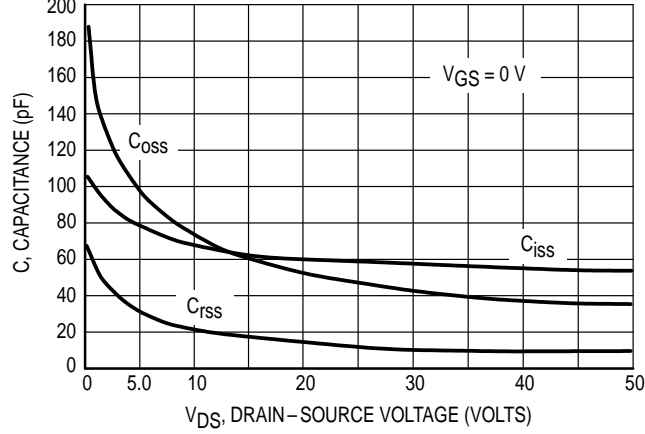


Figure 4. Capacitance Variation

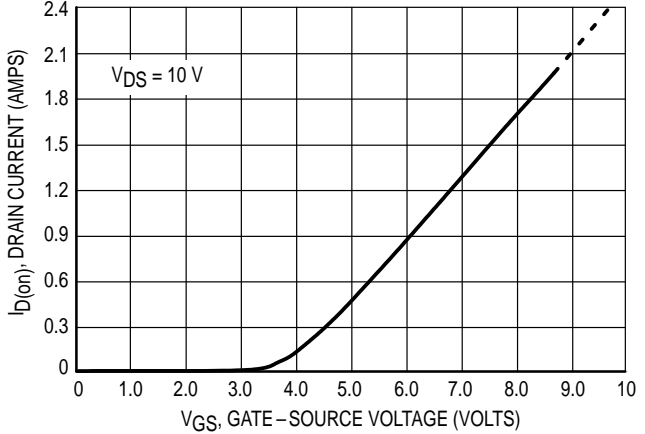


Figure 5. Transfer Characteristic

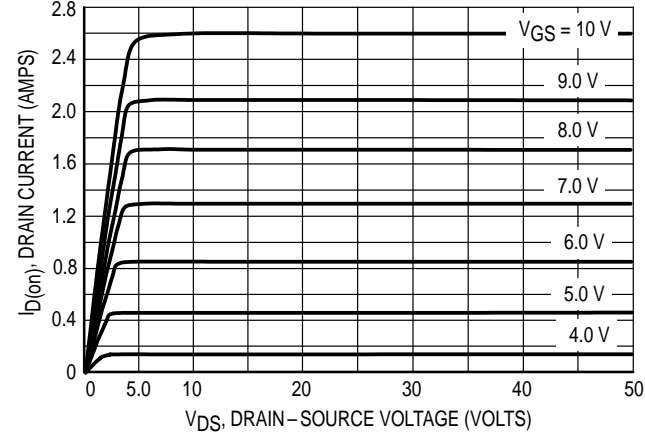


Figure 6. Output Characteristic

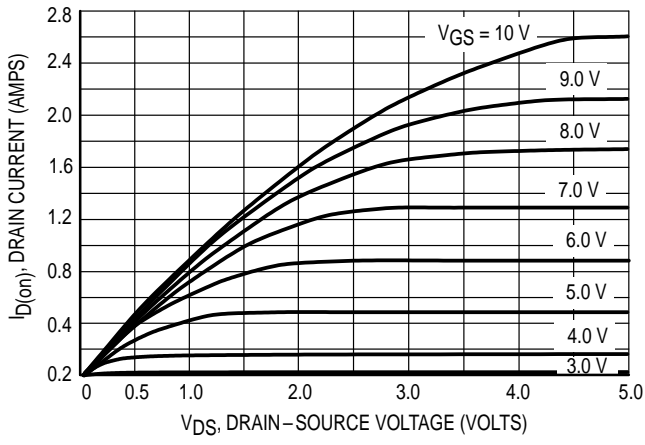
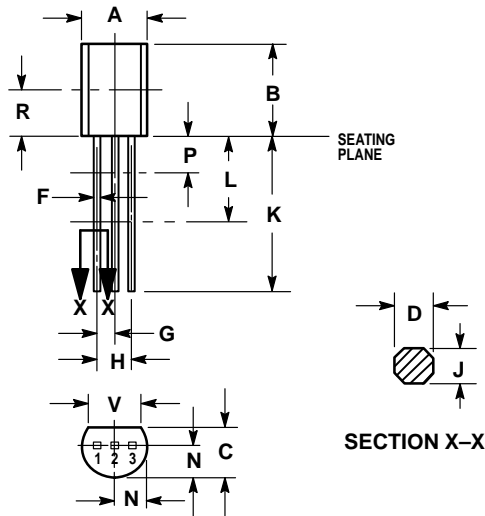


Figure 7. Saturation Characteristic

MPF930 MPF960 MPF990

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.022	0.46	0.56
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.135	—	3.43	—
V	0.135	—	3.43	—

STYLE 22:
 PIN 1. SOURCE
 2. GATE
 3. DRAIN

**CASE 029-05
 (TO-226AE)
 ISSUE AD**

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