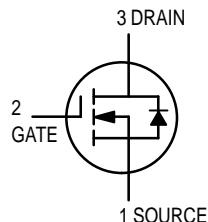
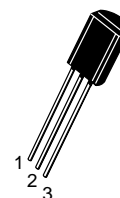


TMOS Switching

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 ($V_{GS} = 0, I_D = 10 \mu A$)	$V_{(BR)DSX}$	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 ($V_{GS} = 10 V_{dc}$) ($I_D = 0.5 \text{ A}$ dc)	$V_{DS(on)}$	—	0.4	0.7	Vdc
		—	0.6	0.8	
		—	0.6	1.2	
($I_D = 1.0 \text{ A}$ dc)		—	0.9	1.4	
		—	1.2	1.7	
		—	1.2	2.4	
($I_D = 2.0 \text{ A}$ dc)		—	2.2	3.0	
		—	2.8	3.5	
		—	2.8	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 $\leq 2.0\%$.

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	
MPF990					
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

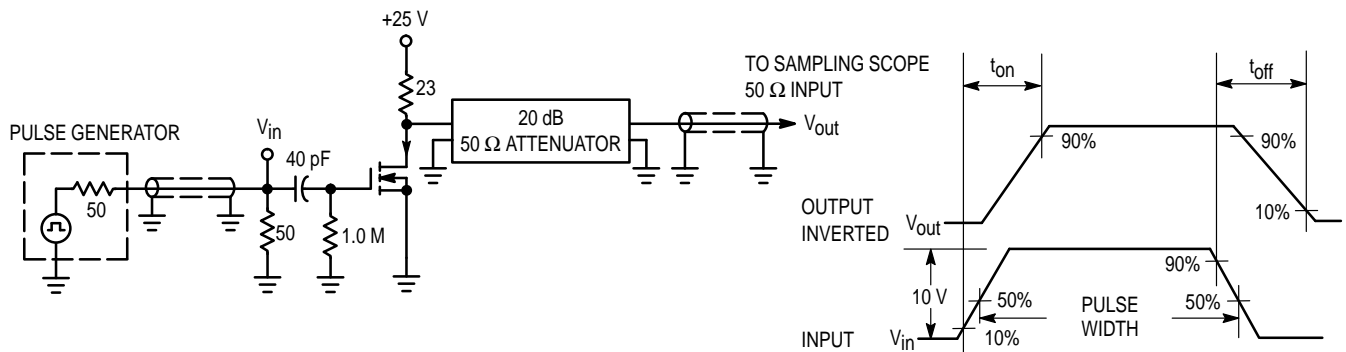


Figure 1. Switching Test Circuit

Figure 2. Switching Waveforms

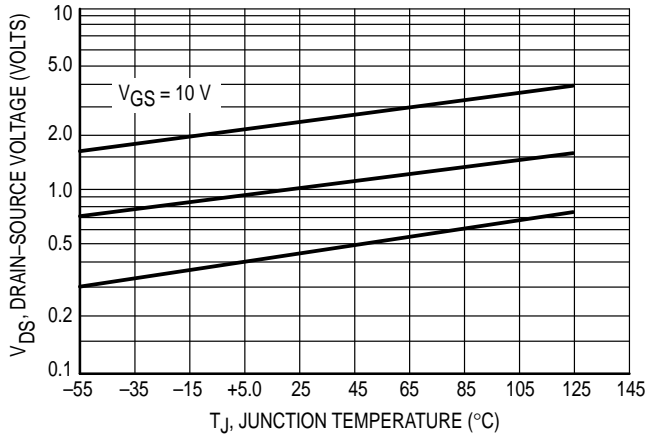


Figure 3. On Voltage versus Temperature

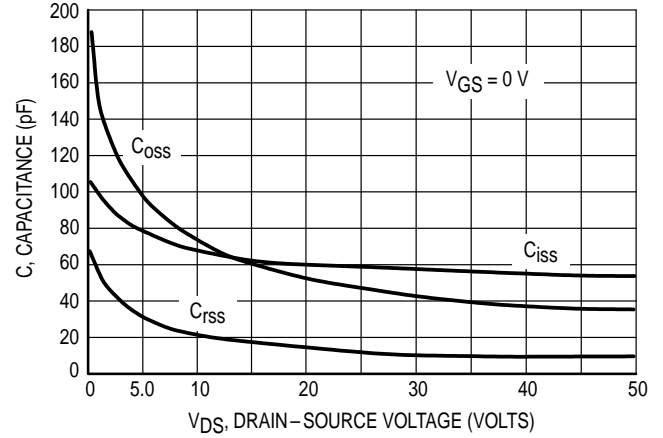


Figure 4. Capacitance Variation

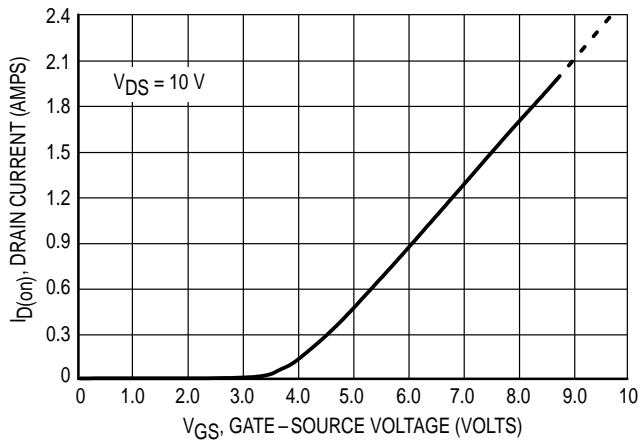


Figure 5. Transfer Characteristic

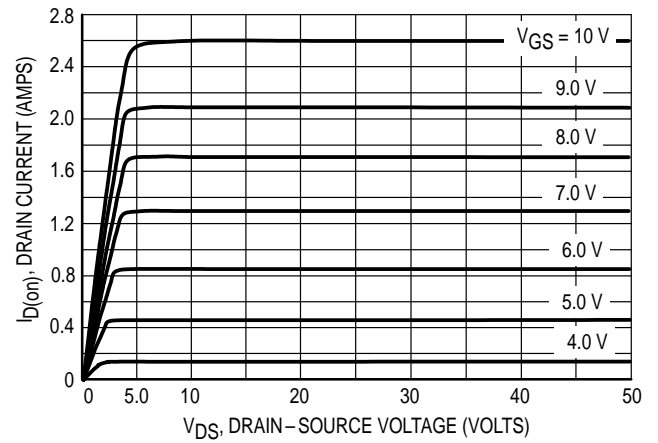


Figure 6. Output Characteristic

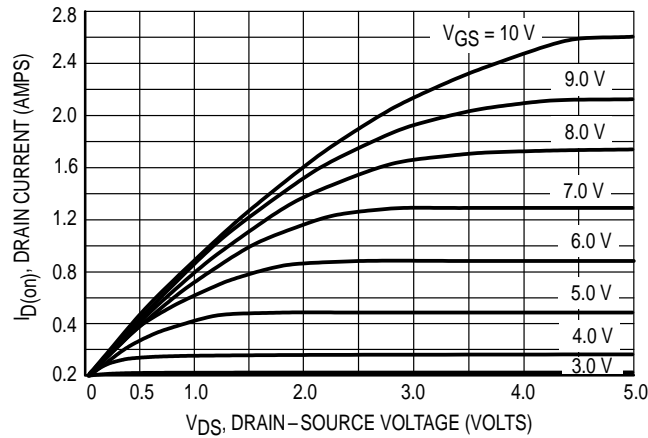
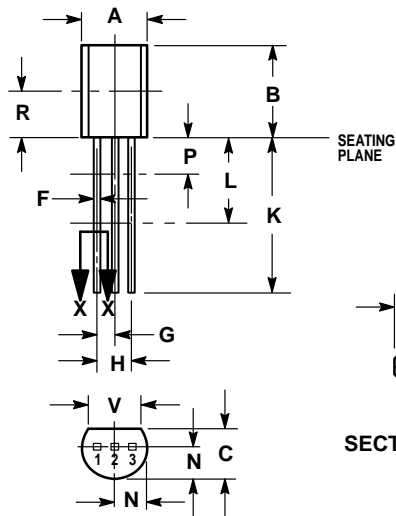


Figure 7. Saturation Characteristic

PACKAGE DIMENSIONS



SECTION X-X

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
- GATE
- DRAIN

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

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How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

