MPF930

TMOS Switching
N−Channel — Enhancement

ON Semiconductor®

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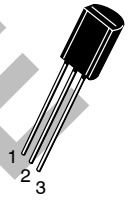
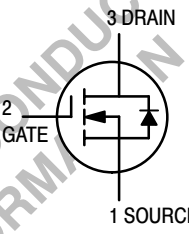


CASE 29−05, STYLE 22
TO−92 (TO−226AE)



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 ($t_p \le 50$ μs)	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°C Derate above 25°C	P_D	1.0 8.0			W mW/°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°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−Source Breakdown Voltage (V_{GS} = 0, I_D = 10 μAdc)		$V_{(BR)DSX}$				Vdc
	MPF930		35	—	—	
	MPF960		60	—	—	
	MPF990		90	—	—	
Gate Reverse Current (V_{GS} = 15 Vdc, V_{DS} = 0)		I_{GSS}	—	—	50	nAdc
ON CHARACTERISTICS(2)						
Zero−Gate−Voltage Drain Current (V_{DS} = Maximum Rating, V_{GS} = 0)		I_{DSS}	—	—	10	μAdc
Gate Threshold Voltage (I_D = 1.0 mAdc, V_{DS} = V_{GS})		$V_{GS(Th)}$	1.0	—	3.5	Vdc
Drain−Source On−Voltage (V_{GS} = 10 Vdc)		$V_{DS(on)}$				Vdc
(I_D = 0.5 Adc)	MPF930		—	0.4	0.7	
	MPF960		—	0.6	0.8	
	MPF990		—	0.6	1.2	
(I_D = 1.0 Adc)	MPF930		—	0.9	1.4	
	MPF960		—	1.2	1.7	
	MPF990		—	1.2	2.4	
(I_D = 2.0 Adc)	MPF930		—	2.2	3.0	
	MPF960		—	2.8	3.5	
	MPF990		—	2.8	4.8	

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS(2) (Continued)						
Static Drain−Source On Resistance (V_{GS} = 10 Vdc, I_D = 1.0 Adc)	MPF930	$r_{DS(on)}$	—	0.9	1.4	Ω
	MPF960		—	1.2	1.7	
	MPF990		—	1.2	2.0	
On−State Drain Current (V_{DS} = 25 Vdc, V_{GS} = 10 Vdc)		$I_{D(on)}$	1.0	2.0	—	Amps
SMALL−SIGNAL CHARACTERISTICS						
Input Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	—	70	—	pF
Reverse Transfer Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{rss}	—	20	—	pF
Output Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{oss}	—	49	—	pF
Forward Transconductance (V_{DS} = 25 Vdc, I_D = 0.5 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 ≤ 300 μs, Duty Cycle ≤ 2.0%.

RESISTIVE SWITCHING

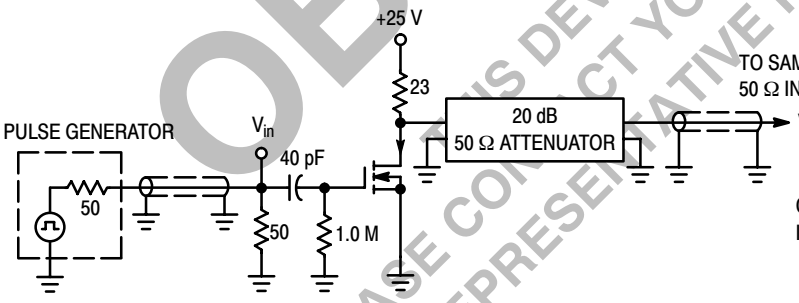


Figure 1. Switching Test Circuit

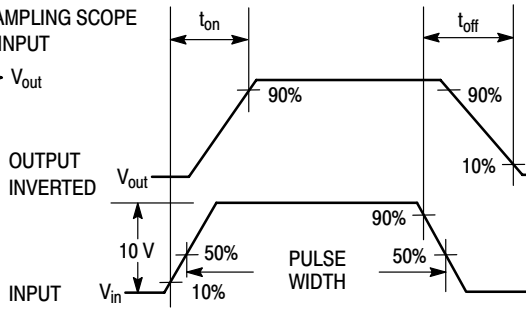


Figure 2. Switching Waveforms

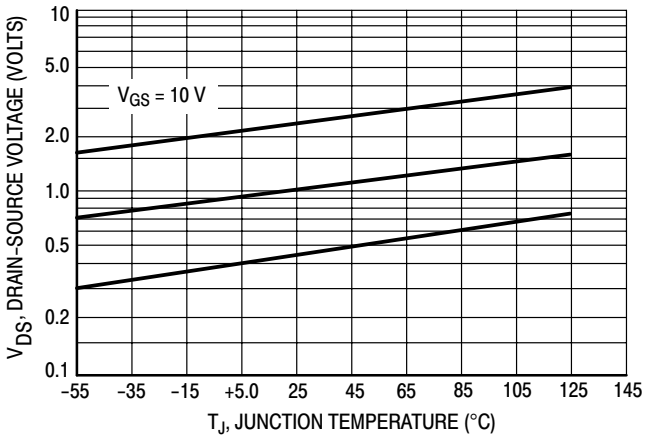


Figure 3. On Voltage versus Temperature

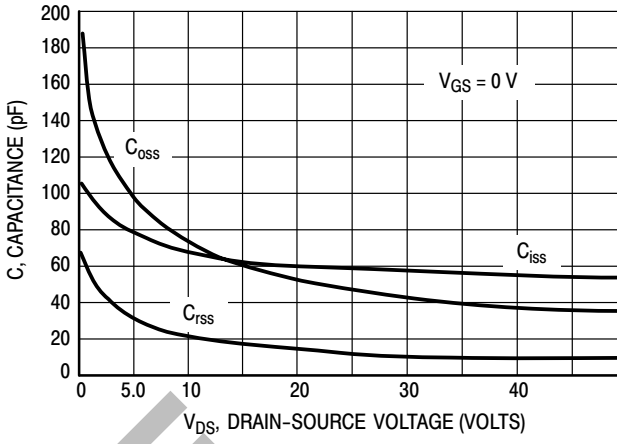


Figure 4. Capacitance Variation

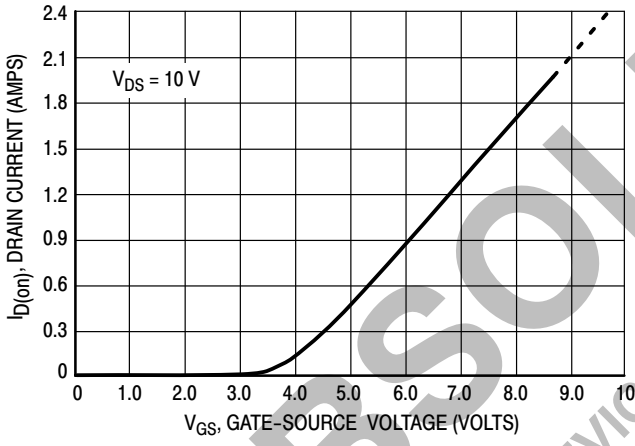


Figure 5. Transfer Characteristic

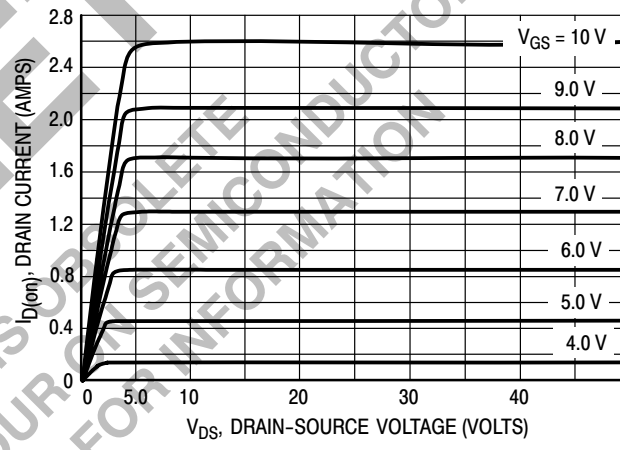


Figure 6. Output Characteristic

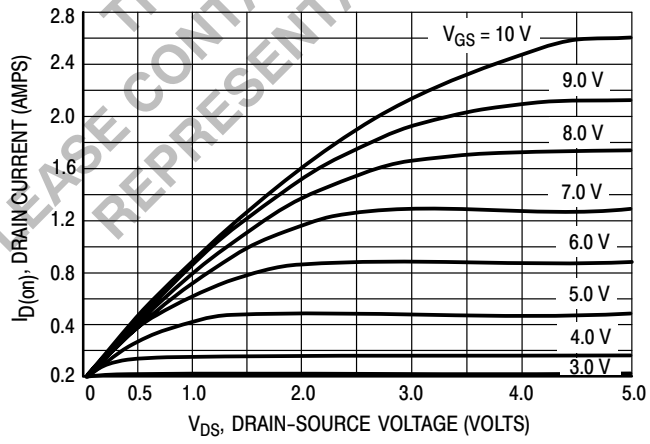
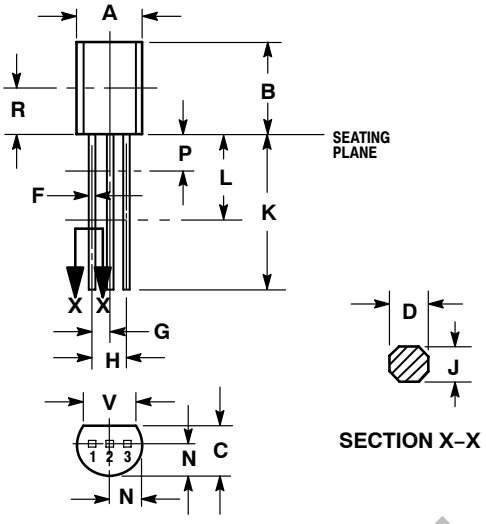


Figure 7. Saturation Characteristic

PACKAGE DIMENSIONS

CASE 029–05
(TO–226AE)
ISSUE AD



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 MIMIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	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

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