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MPF930, MPF960, MPF990

Preferred Device

Small Signal MOSFET 2 Amps, 35, 60, 90 Volts N-Channel TO-92



ON Semiconductor

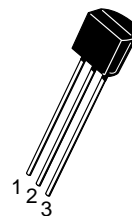
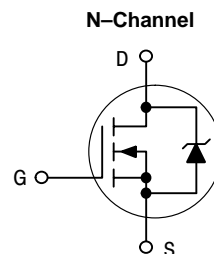
<http://onsemi.com>

2 AMPERES
35, 60, 90 VOLTS
RDS(on) = 0.7 Ω (MPF930)
RDS(on) = 0.8 Ω (MPF960)
RDS(on) = 1.2 Ω (MPF990)

MAXIMUM RATINGS

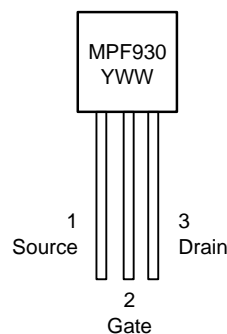
Rating	Symbol	MPF930	MPF960	MPF990	Unit
Drain-Source Voltage	V _{DS}	35	60	90	Vdc
Drain-Gate Voltage	V _{DG}	35	60	90	Vdc
Gate-Source Voltage - Continuous - Non-repetitive (t _p ≤ 50 μs)	V _{GS} V _{GSM}		±20 ±40		Vdc Vpk
Drain Current Continuous (Note 1.) Pulsed (Note 2.)	I _D I _{DM}		2.0 3.0		Adc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D		1.0 8.0		Watts mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}		-55 to 150		°C
Thermal Resistance	θ _{JA}		125		°C/W

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%.



TO-92
CASE 29
Style 22

MARKING DIAGRAM & PIN ASSIGNMENT



Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

MPF930, MPF960, MPF990

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu\text{A}$)	$V_{(BR)DSX}$	35 60 90	- - -	- - -	Vdc
Gate Reverse Current ($V_{GS} = 15 \text{ Vdc}, V_{DS} = 0$)	I_{GSS}	-	-	50	nA

ON CHARACTERISTICS (Note 2.)

Zero-Gate-Voltage Drain Current ($V_{DS} = \text{Maximum Rating}, V_{GS} = 0$)	I_{DSS}	-	-	10	μA
Gate Threshold Voltage ($I_D = 1.0 \text{ mA}, V_{DS} = V_{GS}$)	$V_{GS(Th)}$	1.0	-	3.5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10 \text{ Vdc}$) ($I_D = 0.5 \text{ A}$)	$V_{DS(on)}$	-	0.4	0.7	Vdc
		-	0.6	0.8	
		-	0.6	1.2	
($I_D = 1.0 \text{ A}$)	$V_{DS(on)}$	-	0.9	1.4	Vdc
		-	1.2	1.7	
		-	1.2	2.4	
($I_D = 2.0 \text{ A}$)	$V_{DS(on)}$	-	2.2	3.0	Vdc
		-	2.8	3.5	
		-	2.8	4.8	
Static Drain-Source On Resistance ($V_{GS} = 10 \text{ Vdc}, I_D = 1.0 \text{ A}$)	$r_{DS(on)}$	-	0.9 1.2 1.2	1.4 1.7 2.0	Ω
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 ($V_{DS} = 25 \text{ Vdc}, I_D = 0.5 \text{ A}$)	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 $\leq 2.0\%$.

MPF930, MPF960, MPF990

RESISTIVE SWITCHING

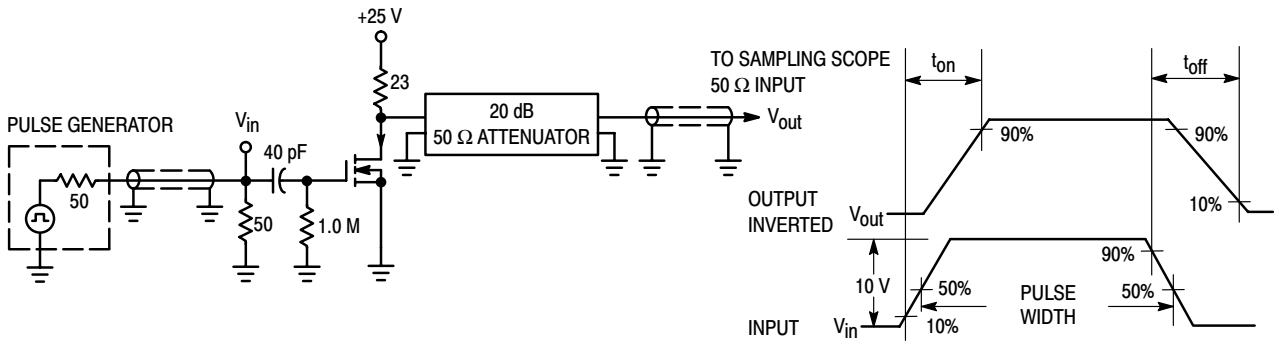


Figure 1. Switching Test Circuit

Figure 2. Switching Waveforms

ORDERING INFORMATION

Device	Package	Shipping
MPF930	TO-92	1000 Unit/Box
MPF930RLRE	TO-92	2000 Tape & Reel
MPF930A	TO-92	1000 Unit/Box
MPF930ARLRE	TO-92	2000 Tape & Reel
MPF960	TO-92	1000 Unit/Box
MPF960RLRA	TO-92	2000 Tape & Reel
MPF990	TO-92	1000 Unit/Box
MPF990RLRA	TO-92	2000 Tape & Reel
MPF990RLRP	TO-92	2000 Ammo Pack

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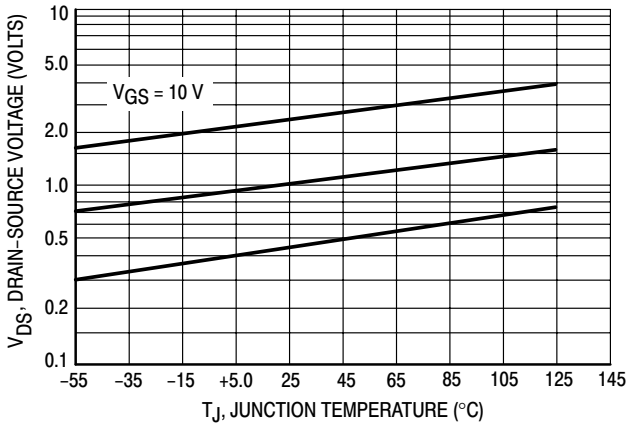


Figure 3. On Voltage versus Temperature

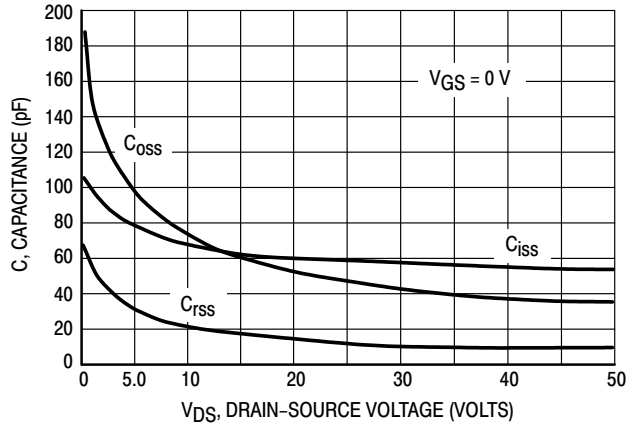


Figure 4. Capacitance Variation

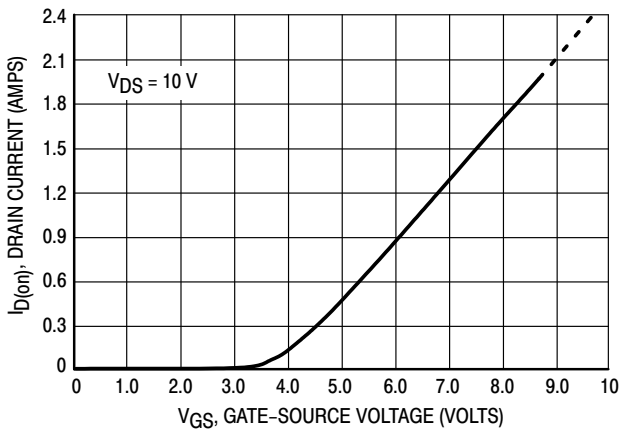


Figure 5. Transfer Characteristic

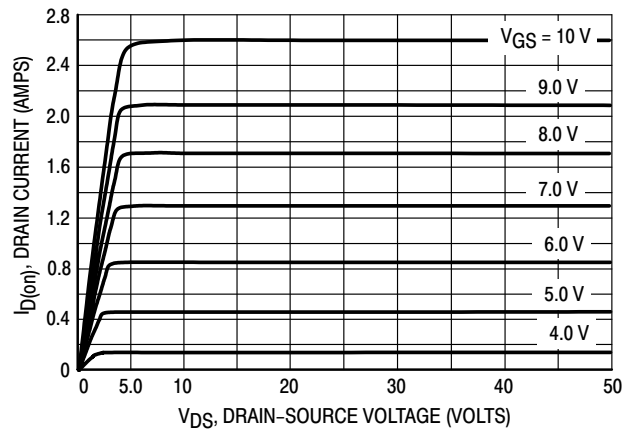


Figure 6. Output Characteristic

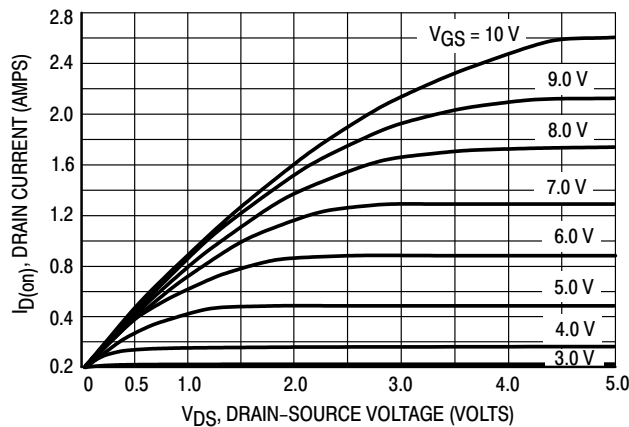
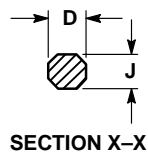
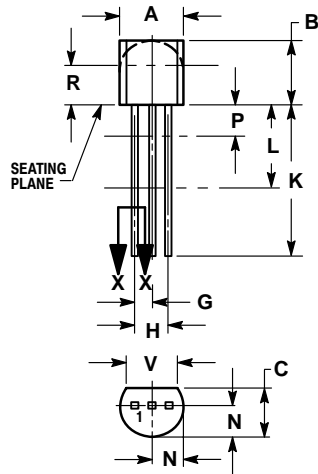


Figure 7. Saturation Characteristic

MPF930, MPF960, MPF990

PACKAGE DIMENSIONS

TO-92
CASE 29-11
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
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	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 22:

- PIN 1. SOURCE
2. GATE
3. DRAIN


MPF930, MPF960, MPF990

Notes

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Notes

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