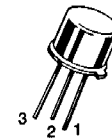


**MFE930  
 MFE960  
 MFE990**

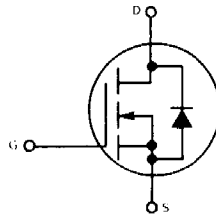
**2.0 AMPERE  
 N-CHANNEL TMOS  
 FET**  
 30, 60, 90 VOLTS



**N-CHANNEL ENHANCEMENT-MODE  
 TMOS FIELD-EFFECT TRANSISTOR**

These TMOS FETs are designed for high-speed switching applications such as switching power supplies, CMOS logic, microprocessor or TTL-to-high current interface and line drivers.

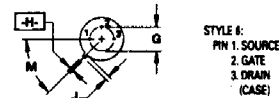
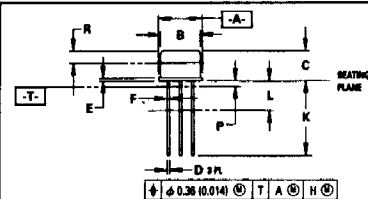
- Fast Switching Speed —  $t_{on} = t_{off} = 7.0$  ns Typ
- Low On-Resistance — 0.9 Ohm Typ MFE930  
 1.2 Ohm Typ MFE960 and MFE990
- Low Drive Requirement,  $V_{GS(th)} = 3.5$  V Max
- Inherent Current Sharing Capability Permits Easy Paralleling of Many Devices



**MAXIMUM RATINGS**

Rating	Symbol	MFE930	MFE960	MFE990	Unit
Drain-Source Voltage	$V_{DSS}$	35	60	90	Vdc
Drain-Gate Voltage	$V_{DGO}$	35	60	90	Vdc
Gate Source Voltage	$V_{GS}$	± 30			Vdc
Drain Current Continuous (1) Pulsed (2)	$I_D$ $I_{DM}$	2.0 3.0			Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	6.25 50			Watts mW/°C
Operating and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150			°C

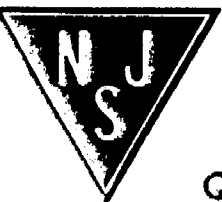
(1) The Power Dissipation of the package may result in a lower continuous drain current.  
 (2) Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
  4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
  5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K. MINIMUM LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.51	0.39	0.020	0.015
B	7.75	8.50	0.305	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	1.04	0.009	0.041
F	0.41	0.48	0.016	0.019
G	0.200 BSC			
H	0.72	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	18.65	0.500	0.750
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
P	—	1.27	—	0.050
R	2.54	—	0.100	—

TO-205AD



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**Quality Semi-Conductors**

## MFE930, 960, 990

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 10 μA)	MFE930 MFE960 MFE990	35 60 90	— — —	— — —	Vdc
Zero Gate Voltage Drain Current (V <sub>DS</sub> = Maximum Rating, V <sub>GS</sub> = 0)		—	—	10	μAdc
Gate-Body Leakage Current (V <sub>GS</sub> = 15 Vdc, V <sub>DS</sub> = 0)		—	—	50	nAdc
<b>ON CHARACTERISTICS*</b>					
Gate Threshold Voltage (V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1.0 mA)		1.0	—	3.5	Vdc
Drain-Source On-Voltage (V <sub>GS</sub> = 10 V) (I <sub>D</sub> = 0.5A)	MFE930 MFE960 MFE990	— — —	0.4 0.6 0.6	0.7 0.8 1.0	Vdc
(I <sub>D</sub> = 1.0 A)	MFE930 MFE960 MFE990	— — —	0.9 1.2 1.2	1.4 1.7 2.0	
(I <sub>D</sub> = 2.0 A)	MFE930 MFE960 MFE990	— — —	2.2 2.8 2.8	3.0 3.5 4.0	
Static Drain-Source On-Resistance (V <sub>GS</sub> = 10 Vdc, I <sub>D</sub> = 1.0 Adc)	MFE930 MFE960 MFE990	— — —	0.9 1.2 1.2	1.4 1.7 2.0	Ohms
On-State Drain Current (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 10 V)		1.0	2.0	—	Amps
Forward Transconductance (V <sub>DS</sub> = 25 V, I <sub>D</sub> = 0.5 A)		200	380	—	mmhos
<b>DYNAMIC CHARACTERISTICS</b>					
Input Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)		—	60	70	pF
Output Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)		—	49	60	pF
Reverse Transfer Capacitance (V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0, f = 1.0 MHz)		—	13	18	pF
<b>SWITCHING CHARACTERISTICS*</b>					
Turn-On Time See Figure 1	t <sub>on</sub>	—	7.0	15	ns
Turn-Off Time See Figure 1	t <sub>off</sub>	—	7.0	15	ns

\* Pulse Test: Pulse Width < 300 μs, Duty Cycle < 2.0%.

### RESISTIVE SWITCHING

FIGURE 1 — SWITCHING TEST CIRCUIT

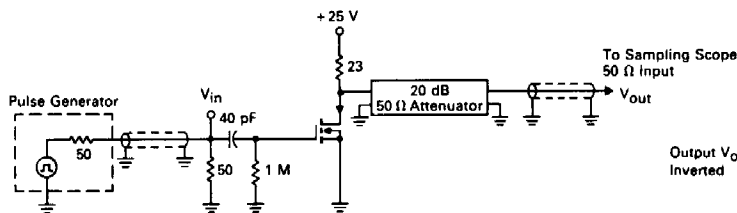


FIGURE 2 — SWITCHING WAVEFORMS

