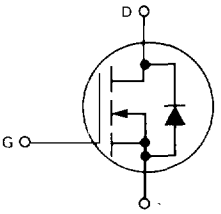
MPF9200

N-CHANNEL ENHANCEMENT-MODE TMOS FIELD-EFFECT TRANSISTOR

This TMOS FET is designed for high voltage, high speed switching applications such as line drivers, relay drivers, CMOS logic, microprocessor or TTL to high voltage interface and high voltage display drivers.

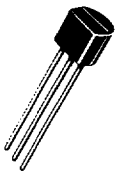
- Fast Switching Speed — $t_{on} = t_{off} = 6.0$ ns typ
- Low On-Resistance — 4.5 Ohms typ
- Low Drive Requirement, $V_{GS(th)} = 4.0$ V max
- Inherent Current Sharing Capability Permits Easy Paralleling of Many Devices

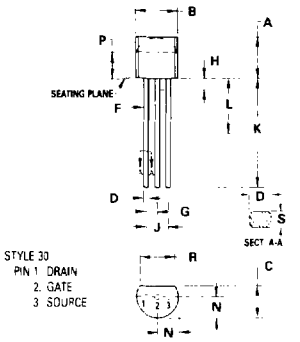
TMOS™



200 VOLTS

N-CHANNEL TMOS FET





NOTES
1. CONTOUR OF PACKAGE BEYOND ZONE "P" IS UNCONTROLLED.
2. DIM "F" APPLIES BETWEEN "H" AND "L". DIM "D" & "S" APPLIES BETWEEN "L" & 12.70mm (0.5") FROM SEATING PLANE. LEAD DIM IS UNCONTROLLED IN "H" & BEYOND 12.70mm (0.5") FROM SEATING PLANE.
3. CONTROLLING DIM: INCH.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	4.32	5.33	0.170	0.210
B	4.45	5.20	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.41	0.55	0.016	0.022
F	0.41	0.48	0.016	0.019
G	1.15	1.39	0.045	0.055
H	—	2.54	—	0.100
J	2.42	2.66	0.095	0.105
K	12.70	—	0.500	—
L	6.35	—	0.250	—
N	2.04	2.66	0.080	0.105
P	2.93	—	0.115	—
R	3.43	—	0.135	—
S	0.39	0.50	0.015	0.020

CASE 29-04
(TO-92)
(TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	200	Vdc
Gate-Source Voltage	V_{GS}	±20	Vdc
Drain Current — Continuous (1) Pulsed (2)	I_D I_{DM}	400 800	mAdc
Total Power Dissipation @ $T_A = 25°C$ Derate above 25°C	P_D	0.6 4.8	Watts mW/°C
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	°C
Thermal Resistance Junction to Ambient	θ_{JA}	208	°C/W

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

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 μA)	$V_{(BR)DSS}$	200	—	—	Vdc
Zero Gate Voltage Drain Current (V_{DS} = 200 V, V_{GS} = 0)	I_{DSS}	—	0.1	10	μAdc
Gate-Body Leakage Current (V_{GS} = 15 Vdc, V_{DS} = 0)	I_{GSS}	—	0.01	50	nAdc
ON CHARACTERISTICS*					
Gate Threshold Voltage (I_D = 1.0 mA, V_{DS} = V_{GS})	$V_{GS(th)}$	1.0	—	4.0	Vdc
Drain-Source On-Voltage (V_{GS} = 10 V)	$V_{DS(on)}$				Vdc
(I_D = 100 mA)		—	0.45	0.6	
(I_D = 250 mA)		—	1.20	1.60	
(I_D = 500 mA)		—	3.0	—	
On State Drain Current (V_{DS} = 25 V, V_{GS} = 10 V	$I_{D(on)}$	400	700	—	mA
Static Drain-Source On-Resistance (V_{GS} = 10 Vdc)	$r_{DS(on)}$				Ohms
(I_D = 100 mA)		—	4.5	6.0	
(I_D = 250 mA)		—	4.8	6.4	
(I_D = 500 mA)		—	6.0	—	
Forward Transconductance (V_{DS} = 25 V, I_D = 250 mA)	g_{FS}	200	400	—	mmhos
DYNAMIC CHARACTERISTICS					
Input Capacitance (V_{DS} = 25 V, V_{GS} = 0, f = 1.0 MHz)	C_{iss}	—	72	90	pF
Output Capacitance (V_{DS} = 25 V, V_{GS} = 0, f = 1.0 MHz)	C_{oss}	—	15	20	pF
Reverse Transfer Capacitance (V_{DS} = 25 V, V_{GS} = 0, f = 1.0 MHz)	C_{rss}	—	2.8	3.5	pF
SWITCHING CHARACTERISTICS*					
Turn-On Time See Figure 1	t_{on}	—	6.0	15	ns
Turn-Off Time See Figure 1	t_{off}	—	12	15	ns

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

RESISTIVE SWITCHING

FIGURE 1 — SWITCHING TEST CIRCUIT

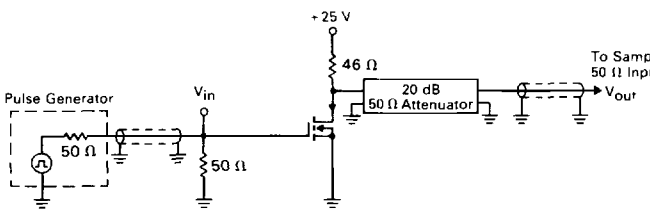


FIGURE 2 — SWITCHING WAVEFORMS

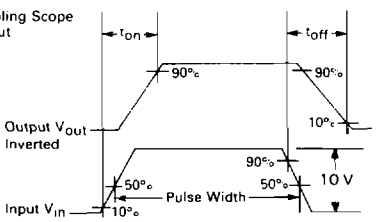


FIGURE 3 — ON VOLTAGE versus TEMPERATURE

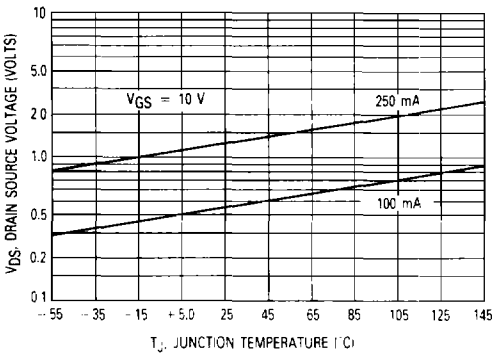


FIGURE 4 — CAPACITANCE VARIATION

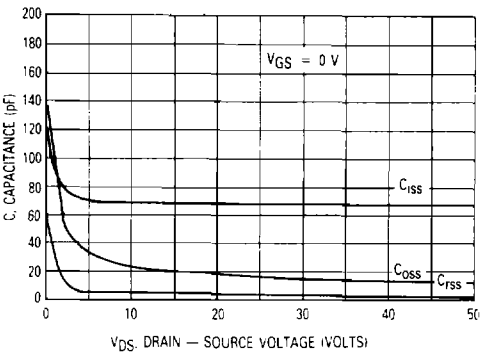


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FIGURE 5 — TRANSFER CHARACTERISTIC

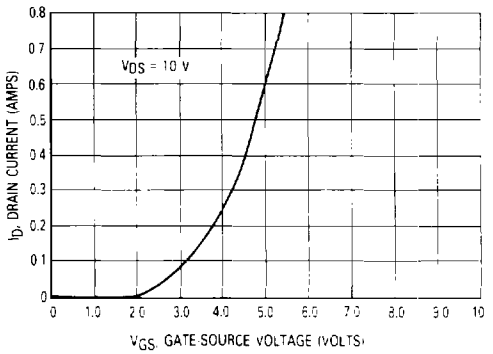

FIGURE 6 — OUTPUT CHARACTERISTIC

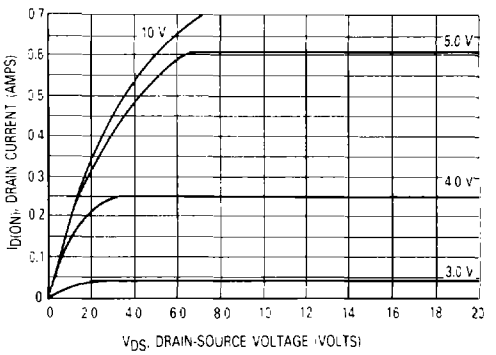

FIGURE 7 — SATURATION CHARACTERISTIC