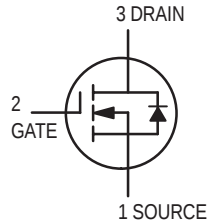
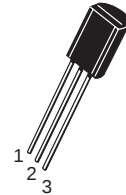


# TMOS Switching

## N-Channel — Enhancement



**MPF910**



**CASE 29-05, STYLE 22**  
**TO-92 (TO-226AE)**

### MAXIMUM RATINGS

| Rating                                                                            | Symbol                | Value                | Unit                    |
|-----------------------------------------------------------------------------------|-----------------------|----------------------|-------------------------|
| Drain–Source Voltage                                                              | $V_{DS}$              | 60                   | Vdc                     |
| Gate–Source Voltage<br>— Continuous<br>— Non-repetitive ( $t_p \leq 50 \mu s$ )   | $V_{GS}$<br>$V_{GSM}$ | $\pm 20$<br>$\pm 40$ | Vdc<br>Vpk              |
| Drain Current – Continuous <sup>(1)</sup><br>— Pulsed <sup>(2)</sup>              | $I_D$<br>$I_{DM}$     | 0.5<br>1.0           | Adc                     |
| Total Device Dissipation @ $T_A = 25^\circ C$<br>Derate above $25^\circ C$ MPF910 | $P_D$                 | 1.0<br>8.0           | Watts<br>mW/ $^\circ C$ |
| Total Device Dissipation @ $T_C = 25^\circ C$<br>Derate above $25^\circ C$ MFE910 | $P_D$                 | 6.25<br>50           | Watts<br>mW/ $^\circ C$ |
| Operating and Storage Junction<br>Temperature Range                               | $T_J, T_{stg}$        | $-65$ to $+150$      | $^\circ C$              |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ C$ unless otherwise noted)

| Characteristic                                                      | Symbol        | Min | Typ  | Max | Unit         |
|---------------------------------------------------------------------|---------------|-----|------|-----|--------------|
| <b>OFF CHARACTERISTICS</b>                                          |               |     |      |     |              |
| Zero–Gate–Voltage Drain Current<br>( $V_{DS} = 40 V, V_{GS} = 0$ )  | $I_{DSS}$     | —   | 0.1  | 10  | $\mu A_{dc}$ |
| Gate Reverse Current<br>( $V_{GS} = 10 V, V_{DS} = 0$ )             | $I_{GSS}$     | —   | 0.01 | 10  | nAdc         |
| Drain–Source Breakdown Voltage<br>( $V_{GS} = 0, I_D = 100 \mu A$ ) | $V_{(BR)DSS}$ | 60  | 90   | —   | Vdc          |

### ON CHARACTERISTICS

|                                                               |              |     |     |     |       |
|---------------------------------------------------------------|--------------|-----|-----|-----|-------|
| Gate Threshold Voltage<br>( $V_{DS} = V_{GS}, I_D = 1.0 mA$ ) | $V_{GS(th)}$ | 0.3 | 1.5 | 2.5 | Vdc   |
| Drain–Source On–Voltage<br>( $V_{GS} = 10 V, I_D = 500 mA$ )  | $V_{DS(on)}$ | —   | —   | 2.5 | Vdc   |
| On–State Drain Current<br>( $V_{DS} = 25 V, V_{GS} = 10 V$ )  | $I_{D(on)}$  | 500 | —   | —   | mA    |
| Forward Transconductance<br>( $V_{DS} = 15 V, I_D = 500 mA$ ) | $g_{fs}$     | 100 | —   | —   | mmhos |

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 2.0\%$ .

RESISTIVE SWITCHING

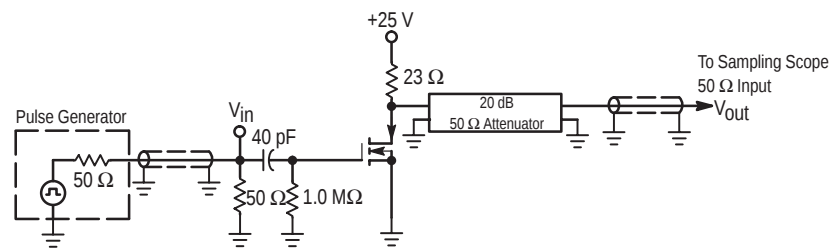


Figure 1. Switching Test Circuit

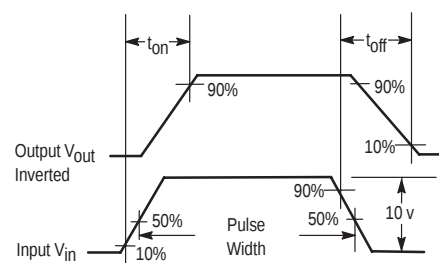


Figure 2. Switching Waveforms

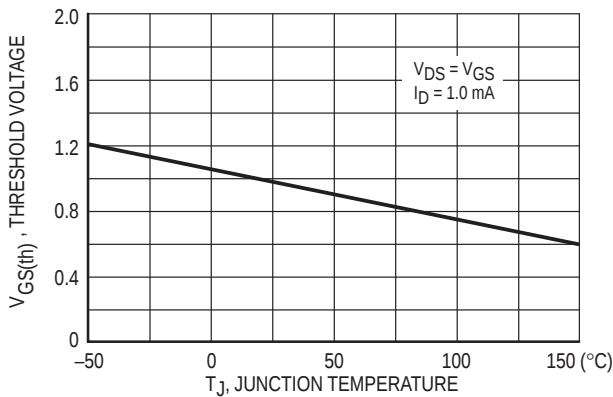


Figure 3.  $V_{GS(th)}$  Normalized versus Temperature

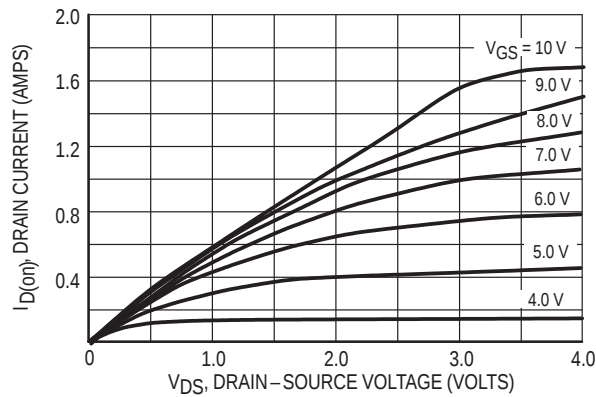


Figure 4. On-Region Characteristics

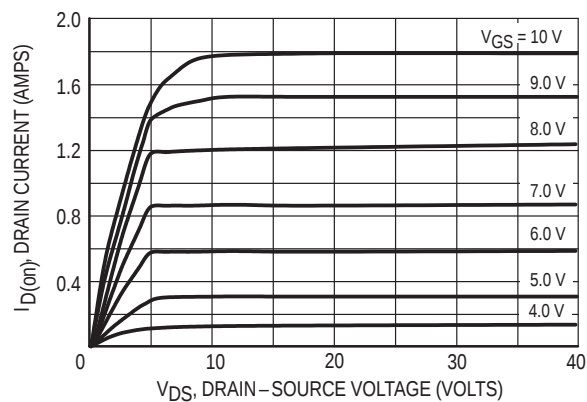


Figure 5. Output Characteristics

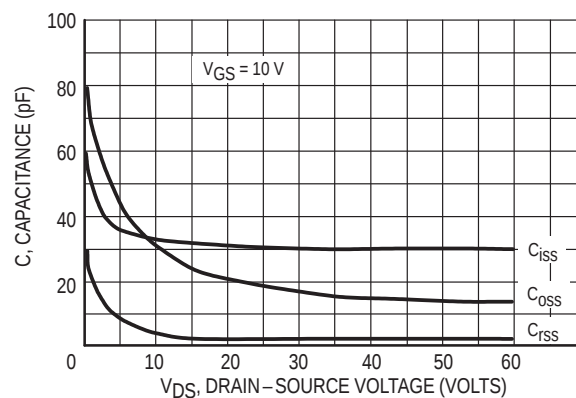
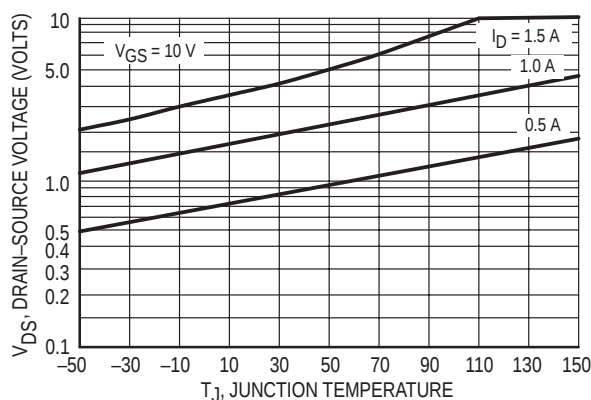
Figure 6. Capacitance versus  
Drain-to-Source Voltage

Figure 7. On Voltage versus Temperature