



UMBF170

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

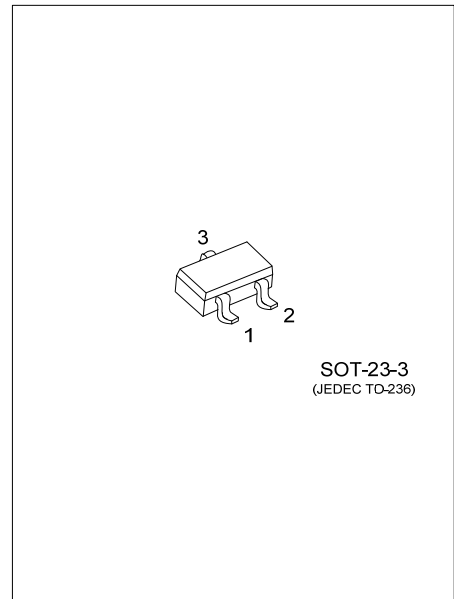
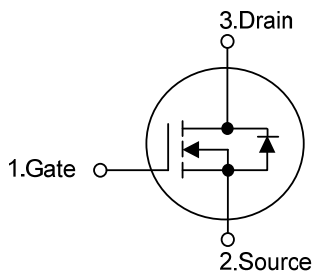
DESCRIPTION

The **UMBF170** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} \leq 5.0\Omega$ @ $V_{GS}=10V, I_D=300mA$
- * $R_{DS(ON)} \leq 5.3\Omega$ @ $V_{GS}=4.5V, I_D=75mA$
- * Low Reverse Transfer Capacitance ($C_{RSS} =$ typical 7.5 pF)
- * Fast Switching Capability
- * Improved dv/dt Capability, High Ruggedness

SYMBOL



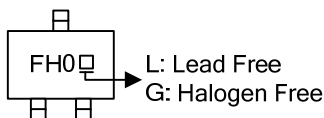
ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|----------------|----------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UMBF170L-AE2-R | UMBF170G-AE2-R | SOT-23-3 | G | S | D | Tape Reel |

Note: Pin Assignment: G: Gate S: Source D: Drain

| | |
|---|---|
| <p>UMBF170G-AE2-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p> | <p>(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|---|---|

MARKING



■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|-----------|------------|-------------|
| Drain-Source Voltage | V_{DSS} | 60 | V |
| Drain-Gate Voltage ($R_G=25K\Omega$) | V_{DGS} | 60 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current ($V_{GS}=10V$) | I_D | 300 | mA |
| Peak Drain Current ($t_P \leq 10\mu s$) | I_{DM} | 1.2 | A |
| Power Dissipation | P_D | 0.83 | W |
| Junction Temperature | T_J | +150 | $^{\circ}C$ |
| Storage Temperature | T_{STG} | -65 ~ +150 | $^{\circ}C$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

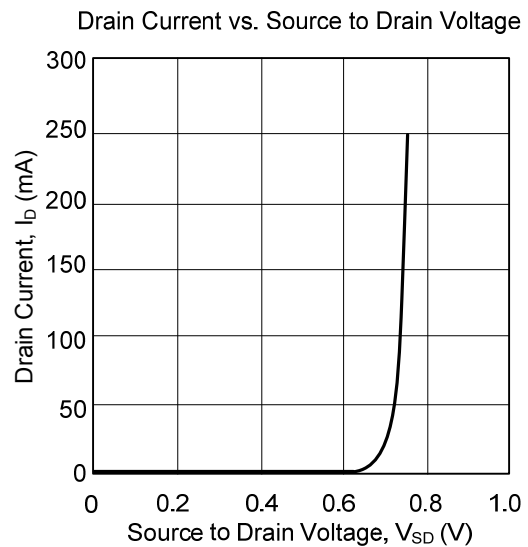
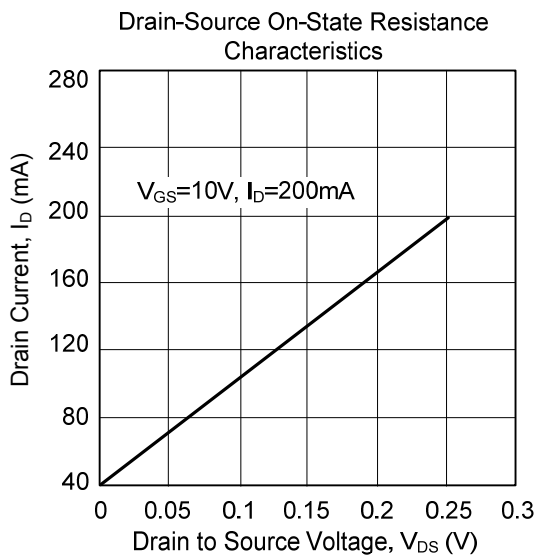
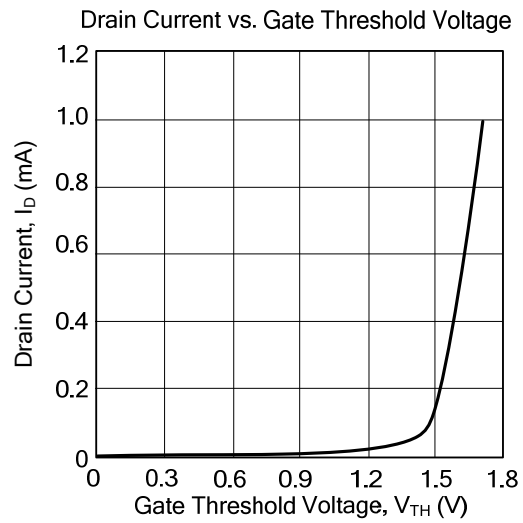
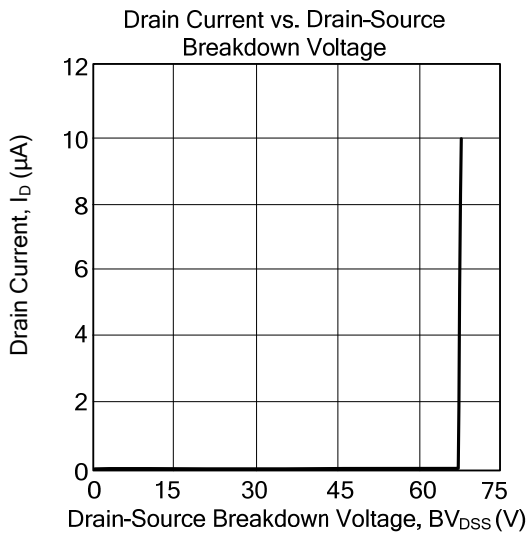
■ THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------------|---------|------|
| Junction to Ambient | θ_{JA} | 350 | K/W |

■ ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}C$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|---|-----|------|-----|----------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=10\mu A$ | 60 | 75 | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=48V, V_{GS}=0V$ | | 0.01 | 1.0 | μA |
| | | $V_{DS}=25V, V_{GS}=0V$ | | 5 | 500 | nA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS} = \pm 15V, V_{DS}=0V$ | | 10 | 100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=1mA$ | 1 | 2 | | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=300mA$ | | 2.8 | 5.0 | Ω |
| | | $V_{GS}=4.5V, I_D=75mA$ | | 3.8 | 5.3 | |
| Forward Transconductance | g_{FS} | $V_{DS}=10V, I_D=200mA$ | 100 | 300 | | mS |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | C_{ISS} | $V_{DS}=10V, V_{GS}=0V, f=1MHz$ | | 25 | 40 | pF |
| Output Capacitance | C_{OSS} | | | 18 | 30 | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 7.5 | 10 | pF |
| SWITCHING PARAMETERS | | | | | | |
| Turn-ON Delay Time | $t_{D(ON)}$ | $V_{DD}=50V, V_{GS}=10V, R_{GS}=50\Omega$ | | 3 | 10 | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | $R_G=50\Omega, R_D=250\Omega$ | | 12 | 15 | ns |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Maximum Body-Diode Continuous Current | I_S | | | | 300 | mA |
| Peak Source (Diode Forward) Current | I_{SM} | pulsed; $t_P \leq 10\mu s$ | | | 1.2 | A |
| Diode Forward Voltage | V_{SD} | $I_S=300mA, V_{GS}=0V$ | | 0.85 | 1.5 | V |
| Body Diode Reverse Recovery Time | t_{rr} | $I_S=300mA, dI/dt=-100A/\mu s,$ | | 30 | | ns |
| Body Diode Reverse Recovery Charge | Q_{rr} | $V_{GS}=0V, V_{DS}=25V$ | | 30 | | nC |

TYPICAL CHARACTERISTICS



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