



UTM2054

Power MOSFET

N-CHANNEL ENHANCEMENT MODE

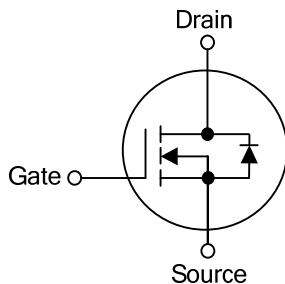
DESCRIPTION

The **UTM2054** 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

- * $R_{DS(ON)} = 35m\Omega @ V_{GS} = 10V$
- * $R_{DS(ON)} = 45m\Omega @ V_{GS} = 4.5V$
- * $R_{DS(ON)} = 110m\Omega @ V_{GS} = 2.5V$
- * Ultra low gate charge (typical 11.5 nC)
- * Low reverse transfer capacitance ($C_{RSS} =$ typical 60 pF)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

SYMBOL

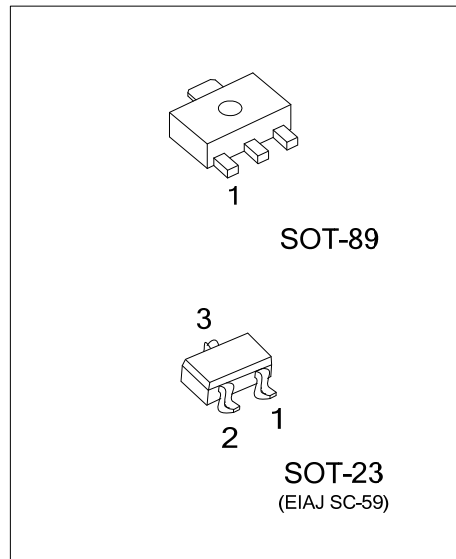
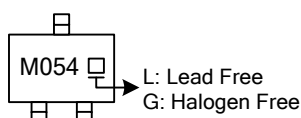


ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|----------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UTM2054L-AB3-R | UTM2054G-AB3-R | SOT-89 | G | D | S | Tape Reel |
| UTM2054L-AE3-R | UTM2054G-AE3-R | SOT-23 | S | G | D | Tape Reel |

| | |
|---|--|
| <p>UTM2054L-AB3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Plating</p> | <p>(1) R: Tape Reel</p> <p>(2) AB3: SOT-89, AE3: SOT-23</p> <p>(3) L: Lead Free, G: Halogen Free</p> |
|---|--|

MARKING (For SOT-23 Package)



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------------------------|------------|------------|--------------------|
| Drain-Source Voltage | V_{DSS} | 20 | V |
| Gate-Source Voltage | V_{GSS} | ± 16 | V |
| Drain Current ($V_{GS}=10\text{V}$) | Continuous | 5 | A |
| | Pulsed | 20 | |
| Diode Continuous Forward Current | I_S | 3 | A |
| Power Dissipation | SOT-89 | 1.47 | W |
| | SOT-23 | 1.25 | W |
| Junction Temperature | T_J | 150 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | $^{\circ}\text{C}$ |

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.

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

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|---|-----|------|-----------|---------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0\text{V}, I_D=250\mu\text{A}$ | 20 | | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=16\text{V}, V_{GS}=0\text{V}$ | | | 1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0\text{V}, V_{GS}=\pm 16\text{V}$ | | | ± 100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 0.6 | 0.9 | 1.5 | V |
| Static Drain-Source On-State Resistance (Note) | $R_{DS(ON)}$ | $V_{GS}=10\text{V}, I_{DS}=5\text{A}$ | | 35 | 40 | m Ω |
| | | $V_{GS}=4.5\text{V}, I_{DS}=3.5\text{A}$ | | 45 | 54 | |
| | | $V_{GS}=2.5\text{V}, I_{DS}=2.5\text{A}$ | | 110 | 130 | |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C_{ISS} | $V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$ | | 450 | | pF |
| Output Capacitance | C_{OSS} | | | 100 | | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 60 | | pF |
| Gate resistance | R_G | $V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$ | | 2.5 | | Ω |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-On Delay Time | $t_{D(ON)}$ | $V_{DD}=10\text{V}, R_L=10\Omega, I_{DS}=1\text{A}, V_{GEN}=4.5\text{V}, R_G=6\Omega$ | | 7 | 10 | ns |
| Turn-On Rise Time | t_R | | | 15 | 25 | ns |
| Turn-Off Delay Time | $t_{D(OFF)}$ | | | 19 | 26 | ns |
| Turn-Off Fall Time | t_F | | | 6 | 7 | ns |
| Total Gate Charge | Q_G | $V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_{DS}=5\text{A}$ | | 11.5 | 15 | nC |
| Gate-Source Charge | Q_{GS} | | | 3.8 | | nC |
| Gate-Drain Charge | Q_{DD} | | | 5.2 | | nC |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note) | V_{SD} | $I_{SD}=3\text{A}, V_{GS}=0\text{V}$ | | 0.7 | 1.3 | V |

Note: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

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