



**SOT-23 Plastic-Encapsulate MOSFETS**

**MKLML6401**

**P-Channel 12-V(D-S) MOSFET**

| V(BR)DSS | RDS(on)MAX  | ID    |
|----------|-------------|-------|
| -12 V    | 50mΩ@-4.5V  | -4.3A |
|          | 85mΩ@-2.5V  |       |
|          | 125mΩ@-1.8V |       |

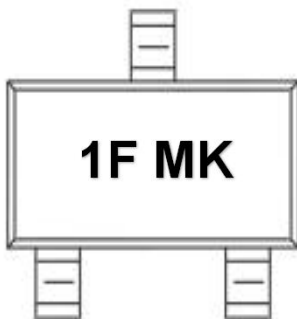
**FEATURE**

- TrenchFET Power MOSFET
- Ultra Low On-Resistance
- Available in Tape and Reel

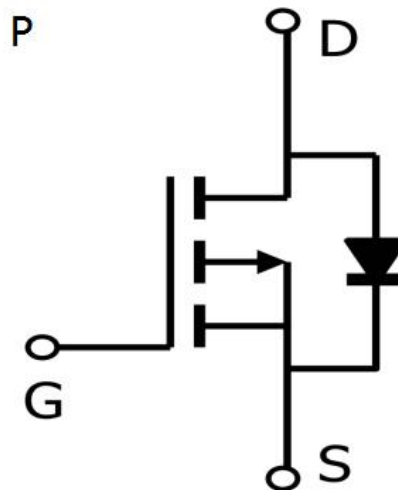
**APPLICATION**

- ※ Load Switch for Portable Devices
- ※ DC/DC Converter

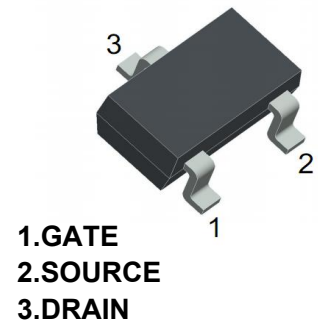
**MARKING**



**Equivalent Circuit**



**SOT-23**



**Maximum ratings ( Ta=25°C unless otherwise noted)**

| Parameter  | Symbol | Value    | Unit |
|--|--------|----------|------|
| Drain-Source Voltage                               | VDS    | -12      | V    |
| Gate-Source Voltage                                | VGS    | ±8       |      |
| Continuous Drain Current                           | ID     | -4.3     | A    |
| Pulsed Diode Current                               | IDM    | -34      |      |
| Power Dissipation                                  | PD     | 1.4      | W    |
| Thermal Resistance from Junction to Ambient (t≤5s) | RθJA   | 100      | °C/W |
| Operating Junction                                 | TJ     | 150      | °C   |
| Storage Temperature                                | TSTG   | -55~+150 |      |

**MOSFET ELECTRICAL CHARACTERISTICS****Static Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)**

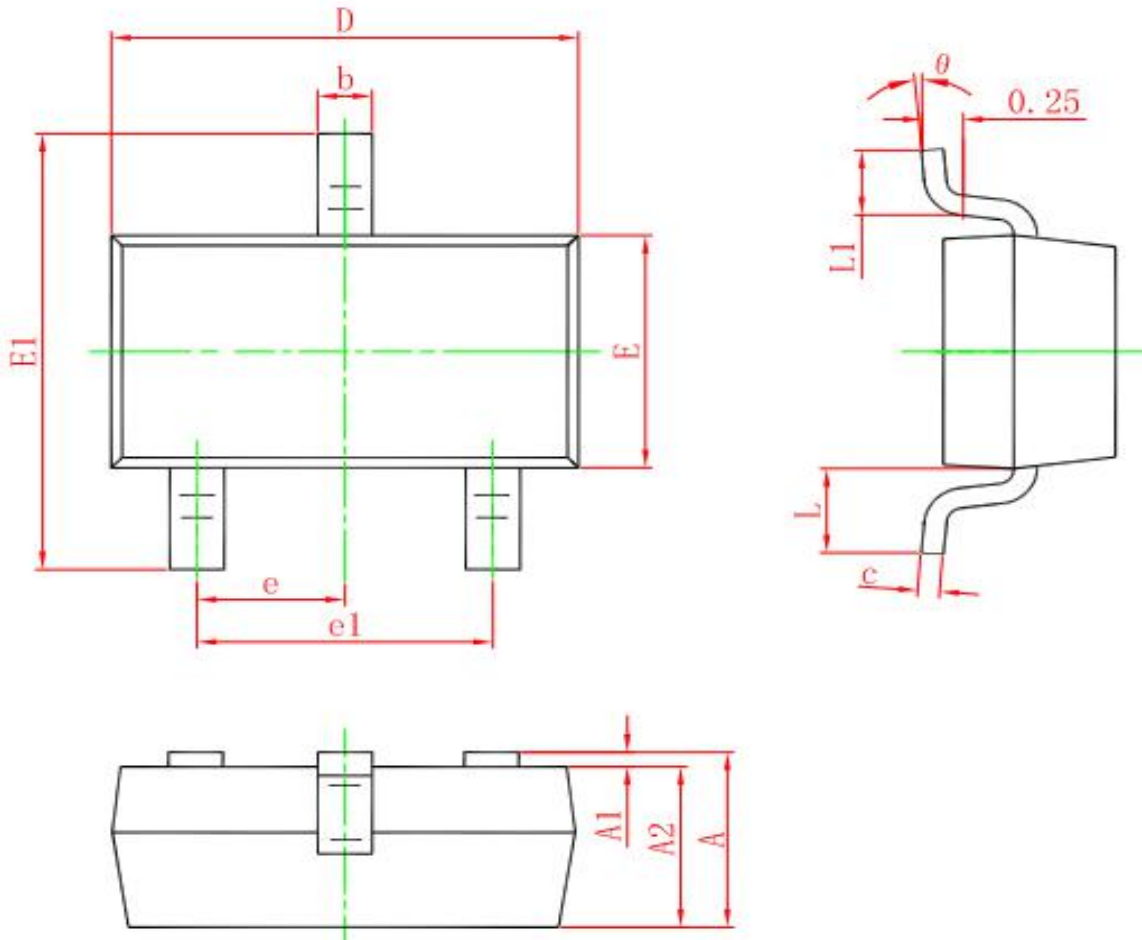
| Parameter                             | Symbol   | Test Condition  | Min  | Typ  | Max  | Unit |
|---------------------------------------|----------|---|------|------|------|------|
| <b>Static</b>                         |          |   |      |      |      |      |
| Drain-source breakdown voltage        | V(BR)DSS | VGS = 0V, ID = -250μA                                     | -12  |      |      | V    |
| Gate-source threshold voltage         | VGS(th)  | VDS = VGS, ID = -250μA                                    | -0.4 |      | -1   | V    |
| Gate-source leakage                   | IGSS     | VDS = 0V, VGS = ±8V                                       |      |      | ±100 | nA   |
| Zero gate voltage drain current       | IDSS     | VDS = -12V, VGS = 0V                                      |      |      | -1   | μA   |
| Drain-source on-state resistancea     | RDS(on)  | VGS = -4.5V, ID = -4.3A                                   |      |      | 50   | mΩ   |
|                                       |          | VGS = -2.5V, ID = -2.5A                                   |      |      | 85   | mΩ   |
|                                       |          | VGS = -1.8V, ID = -2A                                     |      |      | 125  | mΩ   |
| Forward transconductancea             | gfs      | VDS = -4.5V, ID = -4.3A                                   | 8.3  |      |      | S    |
| Diode forward voltage                 | VSD      | IS = -1A, VGS = 0V  |      | -0.8 | -1.2 | V    |
| Continuous Source-Drain Diode Current | IS       |   |      |      | -1.3 | A    |
| <b>Dynamic</b>                        |          |   |      |      |      |      |
| Input capacitance                     | Ciss     | VDS = -10V, VGS = 0V,<br>f = 1MHz                         |      | 830  |      | pF   |
| Output capacitance                    | Coss     |   |      | 180  |      | pF   |
| Reverse transfer capacitanceb         | Crss     |   |      | 125  |      | pF   |
| Total gate charge                     | Qg       | VDS = -10V, VGS = -4.5V,<br>ID = -4.3A                    |      | 10   |      | nC   |
| Gate-source charge                    | Qgs      |   |      | 1.4  |      | nC   |
| Gate-drain charge                     | Qgd      |   |      | 2.6  |      | nC   |
| Gate resistance                       | Rg       | f = 1MHz  |      | 6.5  |      | Ω    |
| <b>Switchingb</b>                     |          |   |      |      |      |      |
| Turn-on delay time                    | td(on)   | VDS = -10V<br>RL = 6Ω, ID ≈ -1A,<br>VGEN = -4.5V, Rg = 3Ω |      | 11   |      | ns   |
| Rise time                             | tr       |   |      | 28   |      | ns   |
| Turn-off delay time                   | td(off)  |   |      | 45   |      | ns   |
| Fall time                             | tf       |   |      | 34   |      | ns   |
| Body Diode Reverse Recovery Time      | Trr      | IF = -4.3A, dI/dt = 100A/μs                               |      | 22   |      | ns   |
| Body Diode Reverse Recovery Charge    | Qrr      | IF = -4.3A, dI/dt = 100A/μs                               |      | 8    |      | nC   |

**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF.                |       | 0.022 REF.           |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |