

### Features

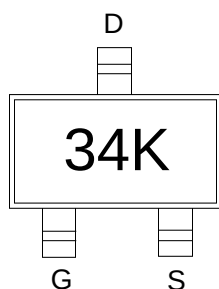
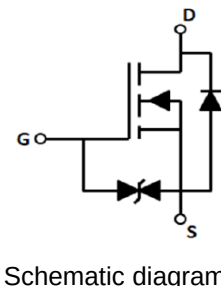
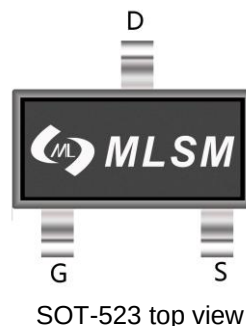
- Trench Power LV MOSFET technology
- High Power and current handing capability

### Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ TYP | $I_D$ |
|----------|------------------|-------|
| 20V      | 135mΩ@4.5V       | 0.75A |
|          | 163mΩ@2.5V       |       |

### Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift



34K: Device code

Marking and pin assignment



Halogen-Free

| Absolute Maximum Ratings (TA=25°C unless otherwise noted) |                                        |         |            |      |
|-----------------------------------------------------------|----------------------------------------|---------|------------|------|
| Symbol                                                    | Parameter                              |         | Rating     | Unit |
| Common Ratings (TC=25°C Unless Otherwise Noted)           |                                        |         |            |      |
| V <sub>DS</sub>                                           | Drain-Source Breakdown Voltage         |         | 20         | V    |
| V <sub>GS</sub>                                           | Gate-Source Voltage                    |         | ±12        | V    |
| T <sub>J</sub>                                            | Maximum Junction Temperature           |         | 150        | °C   |
| T <sub>STG</sub>                                          | Storage Temperature Range              |         | -50 to 155 | °C   |
| I <sub>S</sub>                                            | Diode Continuous Forward Current       | Tc=25°C | 0.75       | A    |
| Mounted on Large Heat Sink                                |                                        |         |            |      |
| I <sub>DM</sub>                                           | Pulse Drain Current Tested             | Tc=25°C | 3          | A    |
| I <sub>D</sub>                                            | Continuous Drain Current               | Tc=25°C | 0.75       | A    |
| P <sub>D</sub>                                            | Maximum Power Dissipation              | Tc=25°C | 0.15       | W    |
| R <sub>θJA</sub>                                          | Thermal Resistance Junction-to-Ambient |         | 833        | °C/W |

### Ordering Information (Example)

| Type      | Package | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|-----------|---------|---------|----------------------|-------------------------|----------------------------|---------------|
| MLS3134KT | SOT-523 | 34K     | 3,000                | 45,000                  | 180,000                    | 7" reel       |

| Electrical Characteristics (TJ=25℃ unless otherwise noted)              |                                  |                                                                                        |      |      |      |      |
|-------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------|------|------|------|------|
| Symbol                                                                  | Parameter                        | Condition                                                                              | Min  | Typ  | Max  | Unit |
| Static Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)  |                                  |                                                                                        |      |      |      |      |
| BV <sub>(BR)DSS</sub>                                                   | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                             | 20   | --   | --   | V    |
| I <sub>DSS</sub>                                                        | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                                              | --   | --   | 1    | μA   |
| I <sub>GSS</sub>                                                        | Gate-Body Leakage Current        | V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V                                             | --   | --   | ±20  | μA   |
| V <sub>GS(th)</sub>                                                     | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                               | 0.35 | 0.70 | 1.10 | V    |
| R <sub>DS(on)</sub>                                                     | Drain-Source On-State Resistance | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.65A                                           | --   | 135  | 380  | mΩ   |
|                                                                         |                                  | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.55A                                           | --   | 163  | 450  | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25℃ (unless otherwise stated) |                                  |                                                                                        |      |      |      |      |
| C <sub>ISS</sub>                                                        | Input Capacitance                | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz                                      | --   | 33   | --   | pF   |
| C <sub>OSS</sub>                                                        | Output Capacitance               |                                                                                        | --   | 21   | --   | pF   |
| C <sub>RSS</sub>                                                        | Reverse Transfer Capacitance     |                                                                                        | --   | 10   | --   | pF   |
| Switching Characteristics                                               |                                  |                                                                                        |      |      |      |      |
| Q <sub>g</sub>                                                          | Total Gate Charge                | V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GS</sub> =4.5V                      | --   | 0.8  | --   | nC   |
| Q <sub>gs</sub>                                                         | Gate Source Charge               |                                                                                        | --   | 0.3  | --   | nC   |
| Q <sub>gd</sub>                                                         | Gate Drain Charge                |                                                                                        | --   | 0.17 | --   | nC   |
| t <sub>d(on)</sub>                                                      | Turn-on Delay Time               | V <sub>DD</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =10Ω | --   | 4.2  | --   | nS   |
| t <sub>r</sub>                                                          | Turn-on Rise Time                |                                                                                        | --   | 19.1 | --   | nS   |
| t <sub>d(off)</sub>                                                     | Turn-Off Delay Time              |                                                                                        | --   | 10.3 | --   | nS   |
| t <sub>f</sub>                                                          | Turn-Off Fall Time               |                                                                                        | --   | 24   | --   | nS   |
| Source- Drain Diode Characteristics                                     |                                  |                                                                                        |      |      |      |      |
| V <sub>SD</sub>                                                         | Forward on voltage               | Tj=25℃, Is=0.75A                                                                       | --   | --   | 1.2  | V    |

## Typical Operating Characteristics

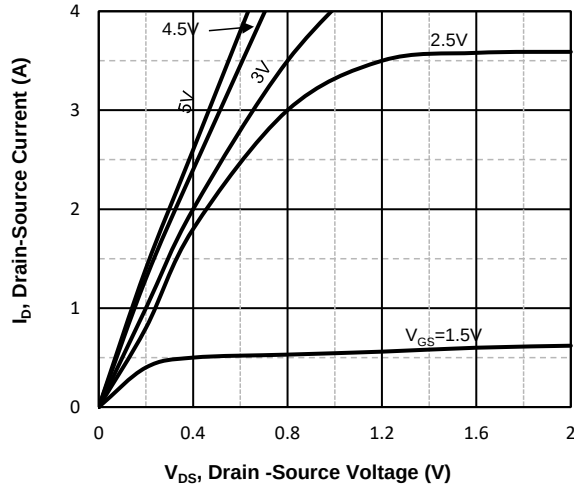


Fig1. Typical Output Characteristics

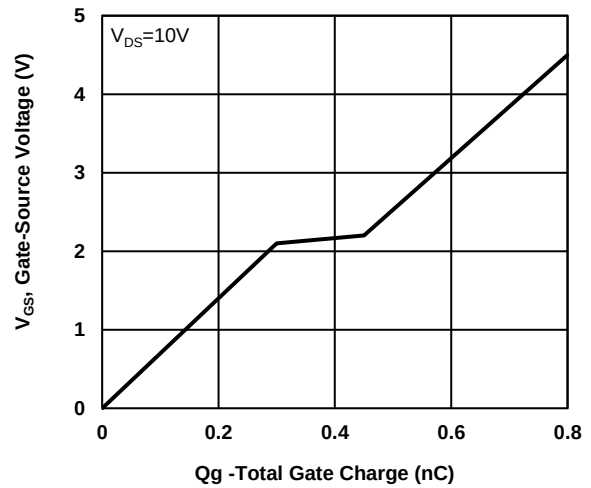


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

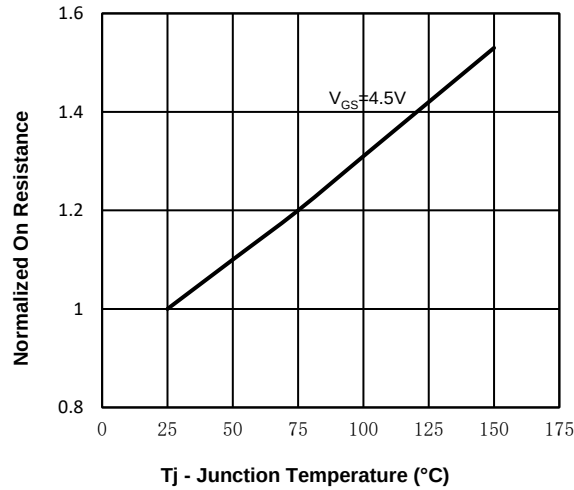


Fig3. Normalized On-Resistance Vs. Temperature

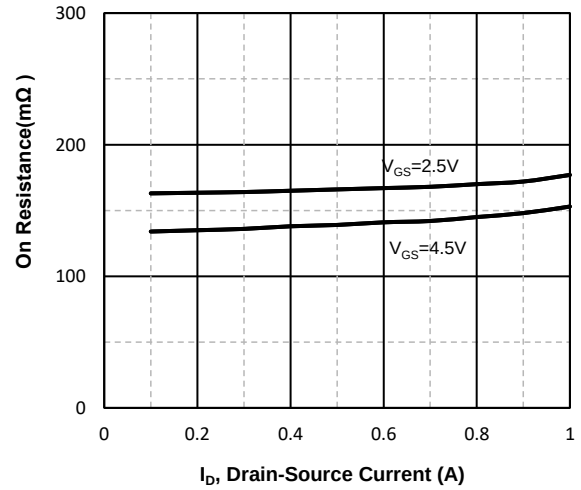


Fig4. On-Resistance Vs. Drain-Source Current

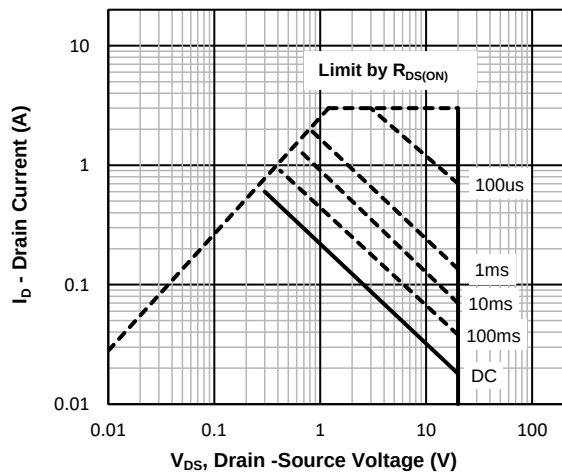


Fig5. Maximum Safe Operating Area

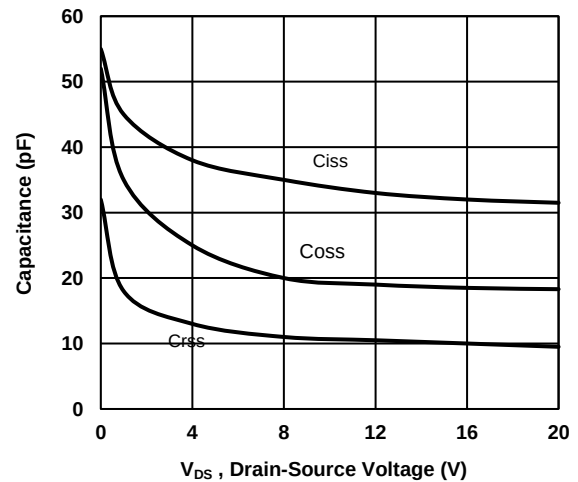
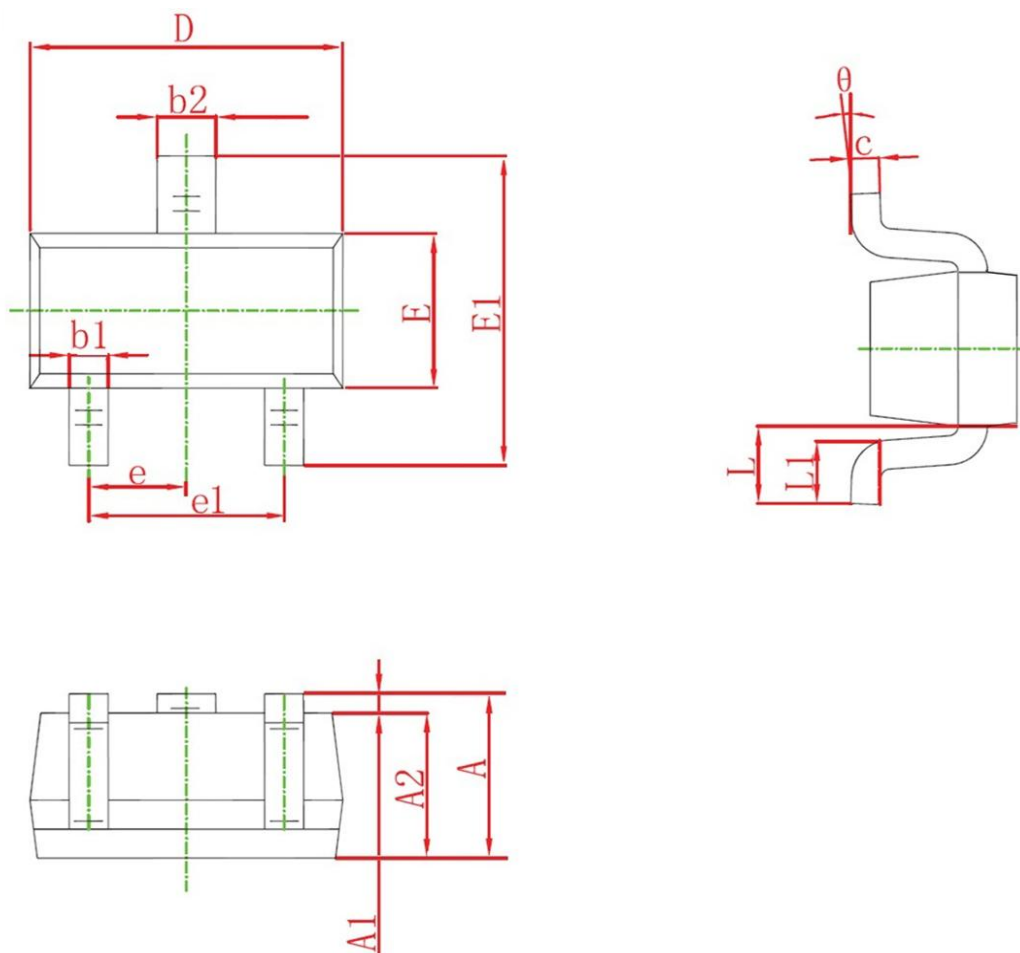


Fig6. Typical Capacitance Vs. Drain-Source Voltage

**SOT-523 Package information**



| Symbol   | Dimensions in Millimeters(mm) |       | Dimensions In Inches |       |
|----------|-------------------------------|-------|----------------------|-------|
|          | Min                           | Max   | Min                  | Max   |
| A        | 0.700                         | 0.900 | 0.028                | 0.035 |
| A1       | 0.000                         | 0.100 | 0.000                | 0.004 |
| A2       | 0.700                         | 0.800 | 0.028                | 0.031 |
| b1       | 0.150                         | 0.250 | 0.006                | 0.010 |
| b2       | 0.250                         | 0.350 | 0.010                | 0.014 |
| c        | 0.100                         | 0.200 | 0.004                | 0.008 |
| D        | 1.500                         | 1.700 | 0.059                | 0.067 |
| E        | 0.700                         | 0.900 | 0.028                | 0.035 |
| E1       | 1.450                         | 1.750 | 0.057                | 0.069 |
| e        | 0.500TYP                      |       | 0.020TYP             |       |
| e1       | 0.900                         | 1.100 | 0.035                | 0.043 |
| L        | 0.400REF                      |       | 0.016REF             |       |
| L1       | 0.260                         | 0.460 | 0.010                | 0.018 |
| $\theta$ | 0°                            | 8°    | 0°                   | 8°    |