

## Features

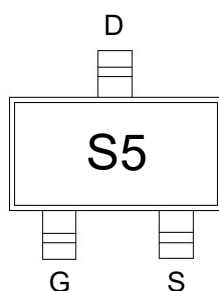
- Leading trench technology for low  $R_{DS(on)}$
- Low Gate Charge

## Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|----------|------------------|-----------|
| -15V     | 45mΩ@-4.5V       | -5A       |
|          | 60mΩ@-2.5V       |           |

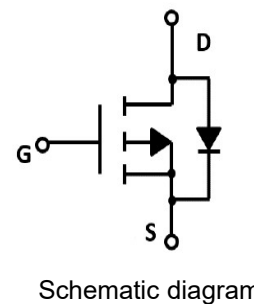
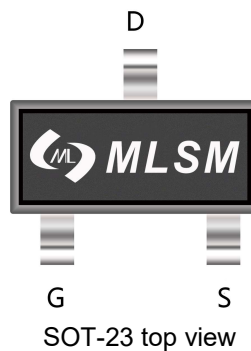
## Application

- Video monitor
- Power management



S5: 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)

|           |                                  |                        |            |    |
|-----------|----------------------------------|------------------------|------------|----|
| $V_{DS}$  | Drain-Source Breakdown Voltage   |                        | -15        | V  |
| $V_{GS}$  | Gate-Source Voltage              |                        | ±10        | V  |
| $T_J$     | Maximum Junction Temperature     |                        | 150        | °C |
| $T_{STG}$ | Storage Temperature Range        |                        | -55 to 150 | °C |
| $I_S$     | Diode Continuous Forward Current | $T_C=25^\circ\text{C}$ | -5         | A  |

### Mounted on Large Heat Sink

|                 |                                        |                        |      |      |
|-----------------|----------------------------------------|------------------------|------|------|
| $I_{DM}$        | Pulse Drain Current Tested             | $T_C=25^\circ\text{C}$ | -18  | A    |
| $I_D$           | Continuous Drain Current               | $T_C=25^\circ\text{C}$ | -5   | A    |
| $P_D$           | Maximum Power Dissipation              | $T_C=25^\circ\text{C}$ | 0.35 | W    |
| $R_{\theta JA}$ | Thermal Resistance Junction-to-Ambient |                        | 357  | °C/W |

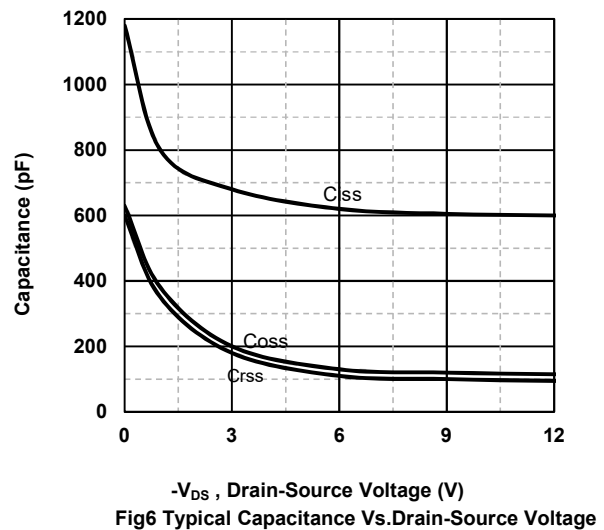
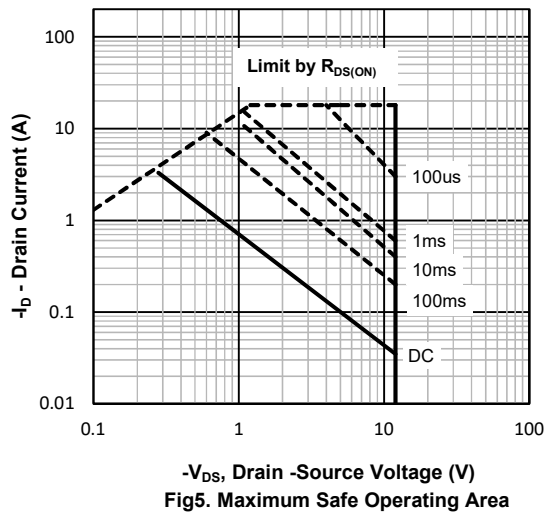
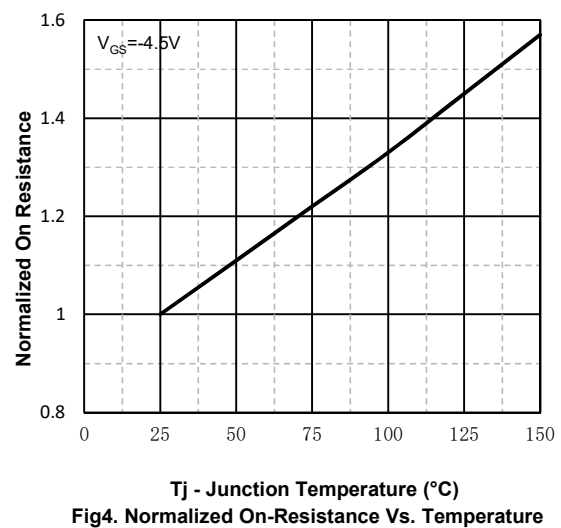
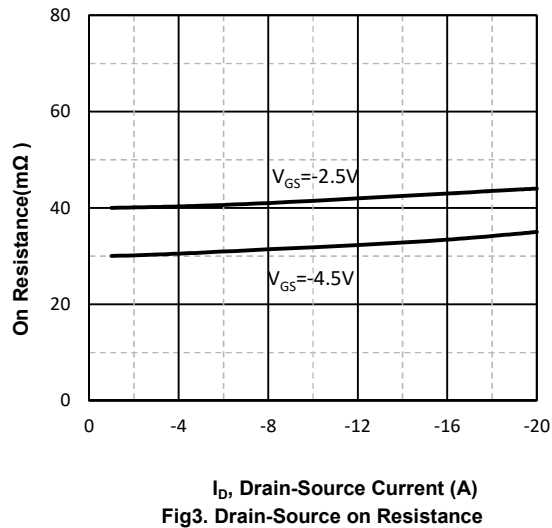
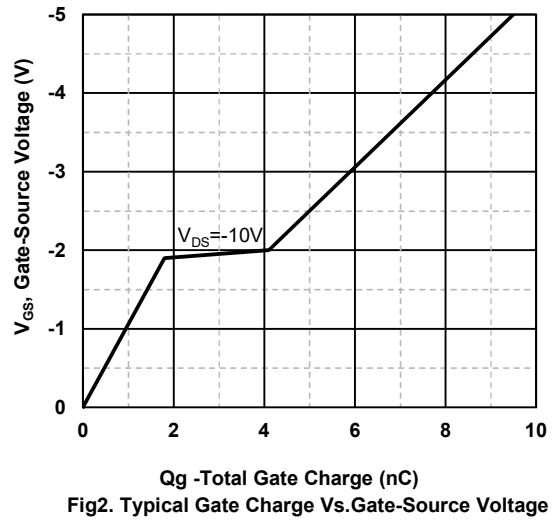
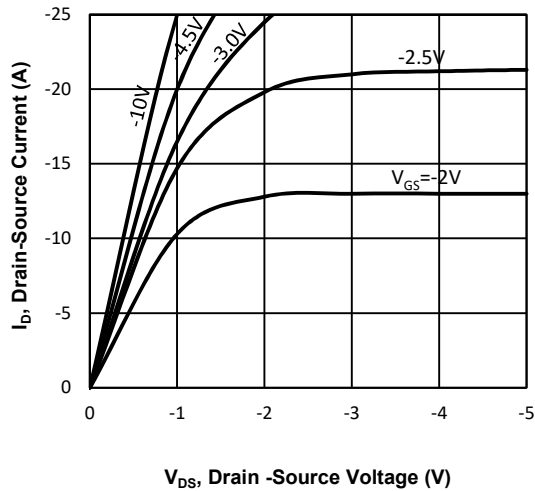
## Ordering Information (Example)

| Type    | Package | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|---------|---------|---------|----------------------|-------------------------|----------------------------|---------------|
| MLS2305 | SOT-23  | S5      | 3,000                | 45,000                  | 180,000                    | 7"reel        |

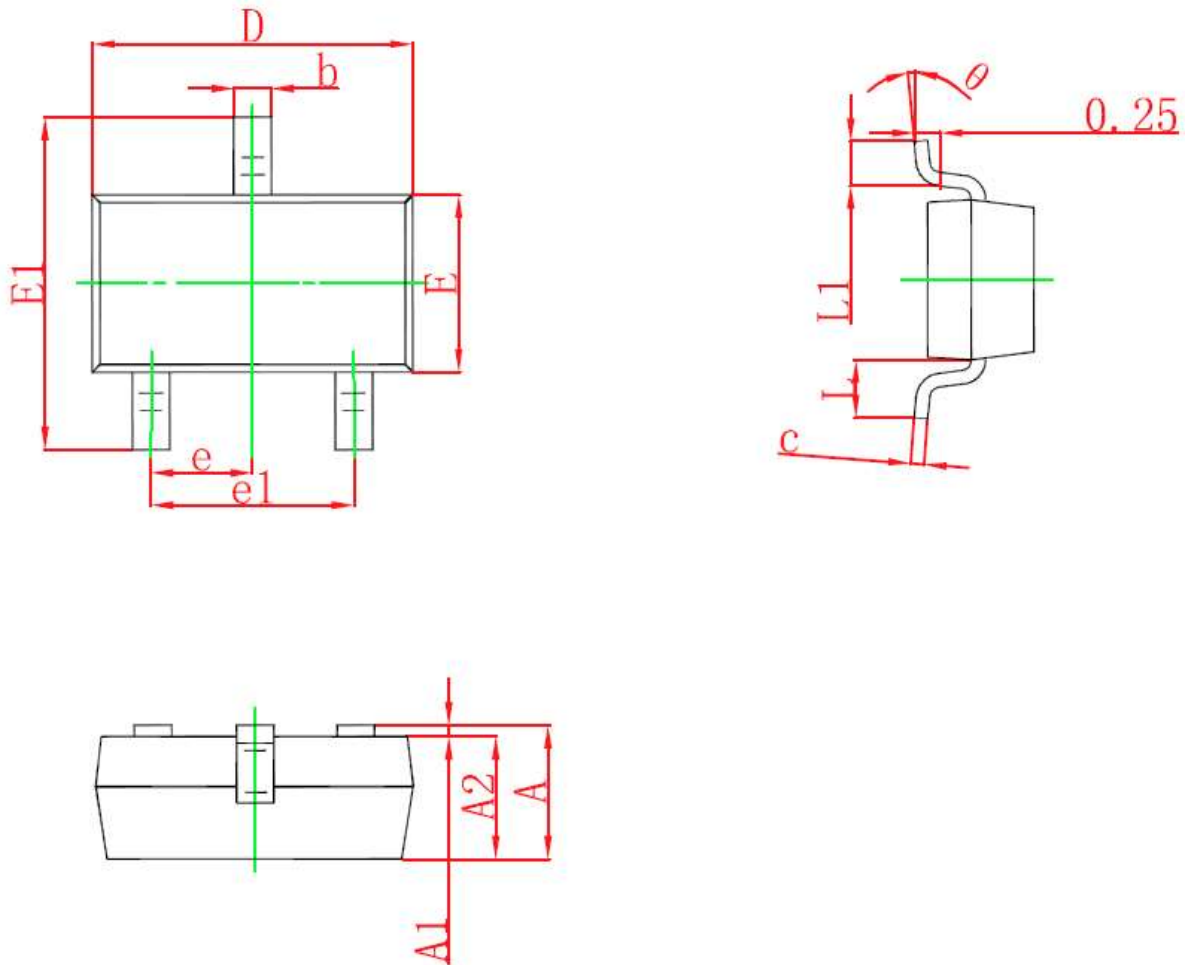
**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

| Symbol                                                                   | Parameter                        | Condition                            | Min  | Typ  | Max  | Unit |
|--------------------------------------------------------------------------|----------------------------------|--------------------------------------|------|------|------|------|
| Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)  |                                  |                                      |      |      |      |      |
| BV(BR)DSS                                                                | Drain-Source Breakdown Voltage   | VGS=0V, ID=-250μA                    | -15  | --   | --   | V    |
| IDSS                                                                     | Zero Gate Voltage Drain Current  | VDS=-15V, VGS=0V                     | --   | --   | -1   | μA   |
| IGSS                                                                     | Gate-Body Leakage Current        | VGS=±10V, VDS=0V                     | --   | --   | ±100 | nA   |
| VGS(th)                                                                  | Gate Threshold Voltage           | VDS=VGS, ID=-250μA                   | -0.4 | -0.6 | -1.0 | V    |
| RDS(on)                                                                  | Drain-Source On-State Resistance | VGS=-4.5V, ID=-3.5A                  | --   | 30   | 45   | mΩ   |
|                                                                          |                                  | VGS=-2.5V, ID=-3.0A                  | --   | 40   | 60   | mΩ   |
|                                                                          |                                  | VGS=-1.8V, ID=-2.0A                  | --   | 60   | 90   | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) |                                  |                                      |      |      |      |      |
| CISS                                                                     | Input Capacitance                | VDS=-10V, VGS=0V, f=1MHz             | --   | 606  | --   | pF   |
| COSS                                                                     | Output Capacitance               |                                      | --   | 114  | --   | pF   |
| CRSS                                                                     | Reverse Transfer Capacitance     |                                      | --   | 103  | --   | pF   |
| Switching Characteristics                                                |                                  |                                      |      |      |      |      |
| Qg                                                                       | Total Gate Charge                | VDS=-10V, ID=-3.8A, VGS=-10V         | --   | 8.48 | --   | nC   |
| Qgs                                                                      | Gate Source Charge               |                                      | --   | 1.54 | --   | nC   |
| Qgd                                                                      | Gate Drain Charge                |                                      | --   | 2.61 | --   | nC   |
| td(on)                                                                   | Turn-on Delay Time               | VDD=-10V, ID=-3.8A, VGS=-4.5V, RG=3Ω | --   | 5.8  | --   | nS   |
| tr                                                                       | Turn-on Rise Time                |                                      | --   | 34.8 | --   | nS   |
| td(off)                                                                  | Turn-Off Delay Time              |                                      | --   | 51.4 | --   | nS   |
| tf                                                                       | Turn-Off Fall Time               |                                      | --   | 52   | --   | nS   |
| Source- Drain Diode Characteristics                                      |                                  |                                      |      |      |      |      |
| VSD                                                                      | Forward on voltage               | Tj=25℃, Is=-4.1A                     | --   | --   | -1.2 | V    |

## Typical Operating Characteristics



SOT-23 Package information



| Symbol | Dimensions in Millimeters(mm) |       | 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 |
| E1     | 2.250                         | 2.550 | 0.088                | 0.100 |
| E      | 1.200                         | 1.400 | 0.047                | 0.055 |
| e      | 0.950TYP                      |       | 0.037TYP             |       |
| 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 |
| θ      | 0°                            | 8°    | 0°                   | 8°    |