

## Features

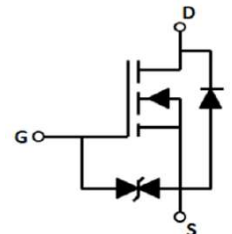
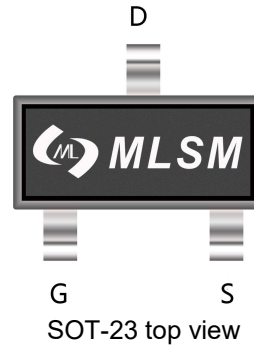
- High Power and current handling capability
- Lead free product is acquired
- Surface mount package

## Product Summary

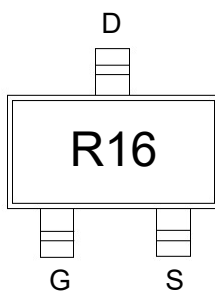
| $V_{DS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|----------|------------------|-----------|
| 20V      | 22mΩ@4.5V        | 6.5A      |
|          | 26mΩ@2.5V        |           |

## Application

- Load Switch
- PWM Application
- Power



Schematic diagram



R16: 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 | 6.5        | A  |

## Mounted on Large Heat Sink

|                 |                                        |                   |     |      |
|-----------------|----------------------------------------|-------------------|-----|------|
| $I_{DM}$        | Pulse Drain Current Tested             | $T_C=25^{\circ}C$ | 30  | A    |
| $I_D$           | Continuous Drain Current               | $T_C=25^{\circ}C$ | 6.5 | A    |
| $P_D$           | Maximum Power Dissipation              | $T_C=25^{\circ}C$ | 1.4 | W    |
| $R_{\theta JA}$ | Thermal Resistance Junction-to-Ambient |                   | 125 | °C/W |

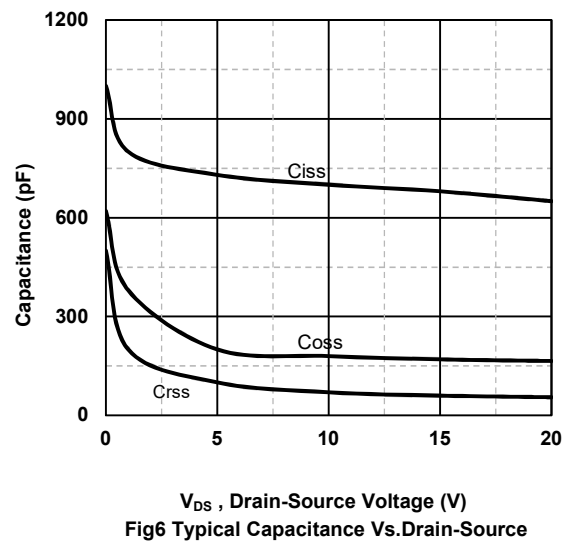
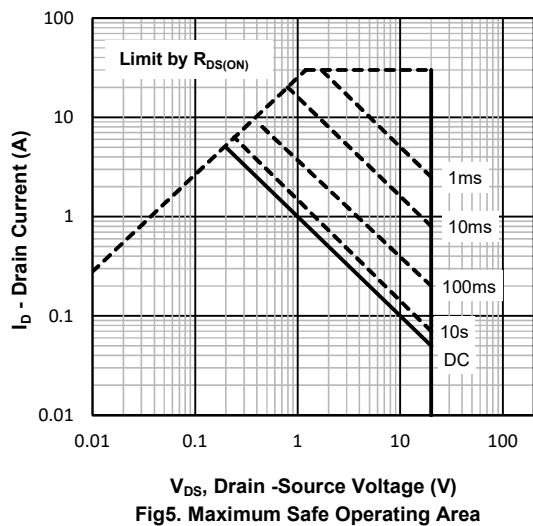
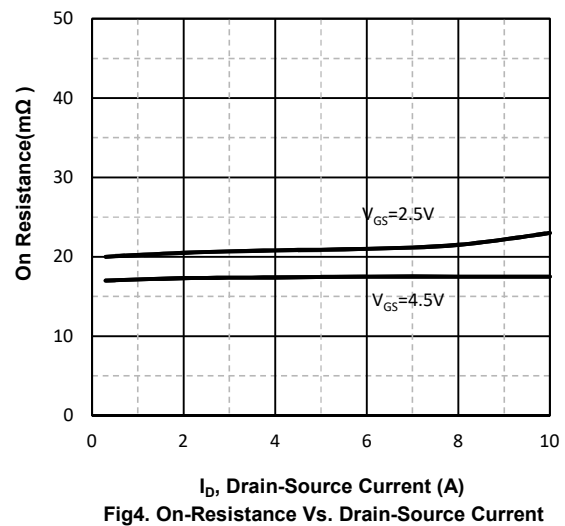
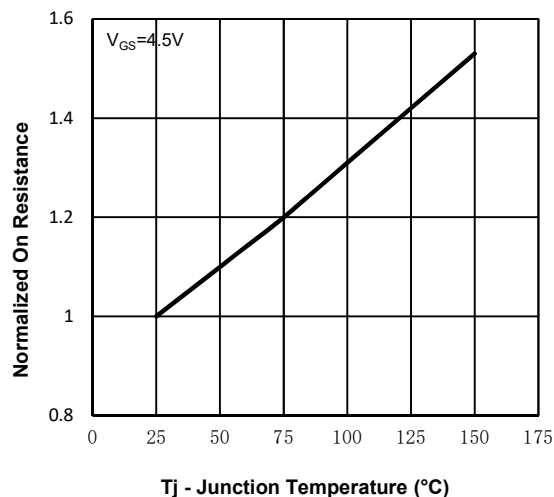
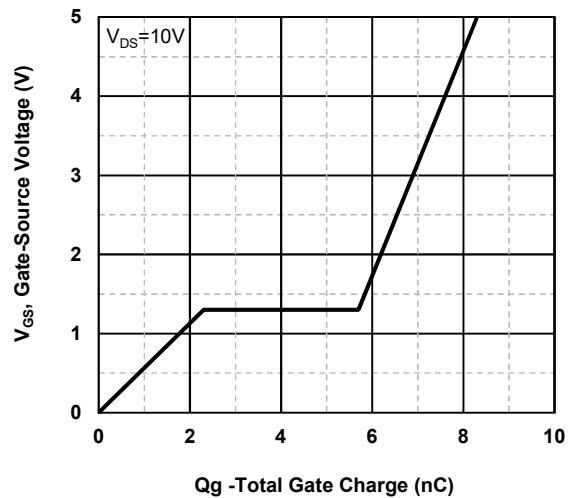
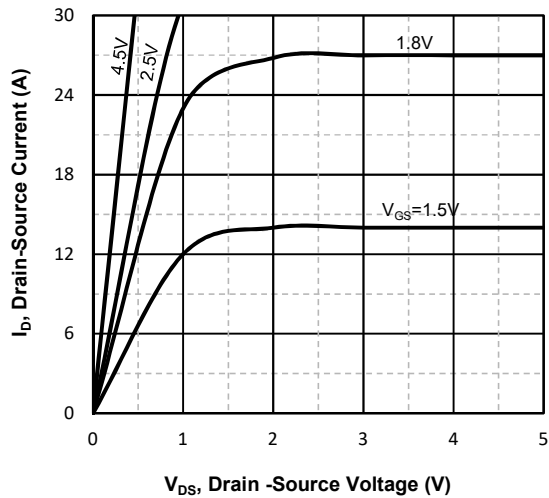
## Ordering Information (Example)

| Type     | Package | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|----------|---------|---------|----------------------|-------------------------|----------------------------|---------------|
| MLS3416E | SOT-23  | R16     | 3,000                | 45,000                  | 180,000                    | 7"reel        |

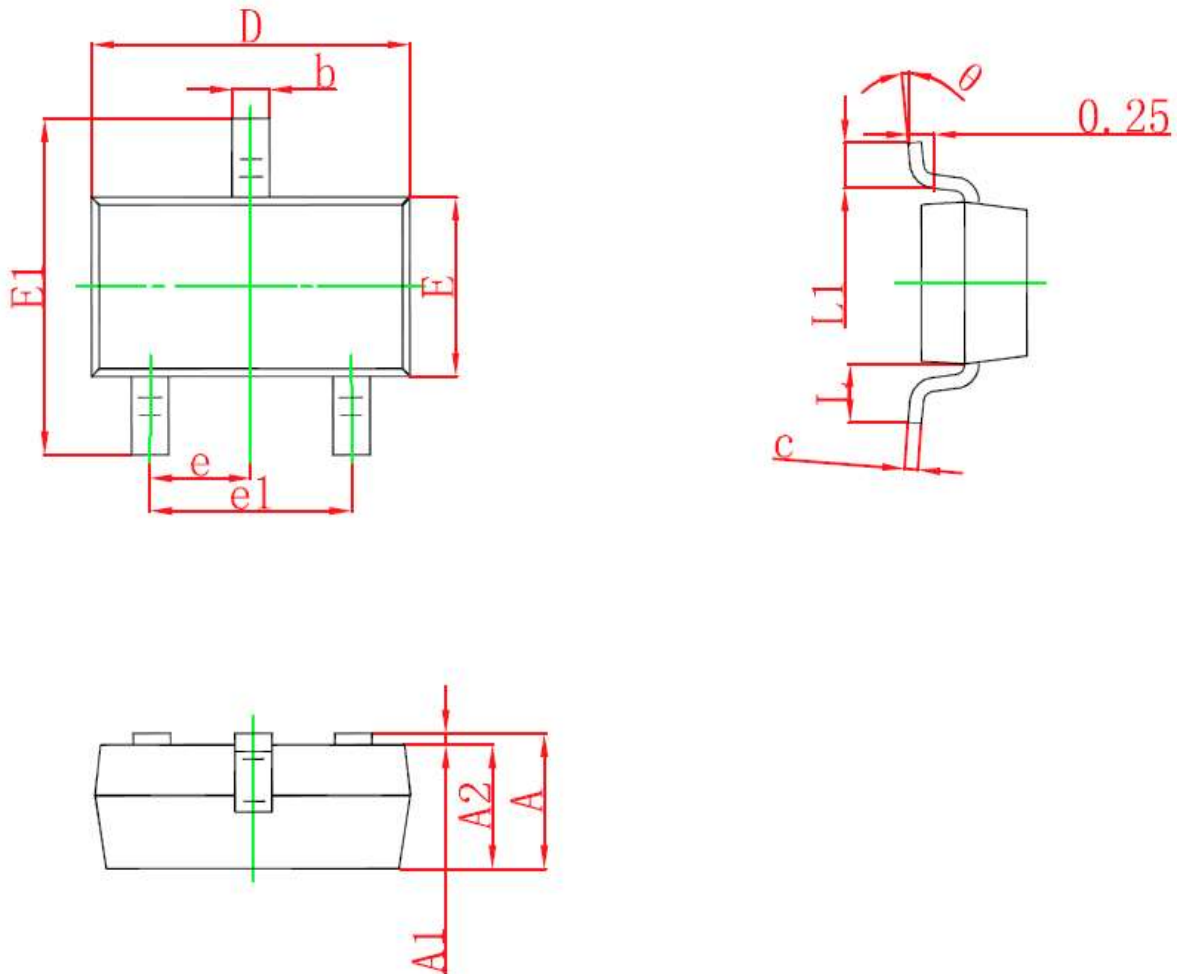


| Electrical Characteristics (TJ=25°C unless otherwise noted)              |                                  |                                    |     |     |     |      |
|--------------------------------------------------------------------------|----------------------------------|------------------------------------|-----|-----|-----|------|
| 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                   | 20  | --  | --  | V    |
| IDSS                                                                     | Zero Gate Voltage Drain Current  | VDS=20V, VGS=0V                    | --  | --  | 1   | μA   |
| IGSS                                                                     | Gate-Body Leakage Current        | VGS=±10V, VDS=0V                   | --  | --  | ±10 | μA   |
| VGS(th)                                                                  | Gate Threshold Voltage           | VDS=VGS, ID=250μA                  | 0.4 | 0.7 | 1.1 | V    |
| RDS(on)                                                                  | Drain-Source On-State Resistance | VGS=4.5V, ID=6.5A                  | --  | 17  | 22  | mΩ   |
|                                                                          |                                  | VGS=2.5V, ID=5.5A                  | --  | 20  | 26  | mΩ   |
|                                                                          |                                  | VGS=1.8V, ID=5.0A                  | --  | 35  | 50  | mΩ   |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) |                                  |                                    |     |     |     |      |
| Ciss                                                                     | Input Capacitance                | VDS=10V, VGS=0V, f=1MHz            | --  | 660 | --  | pF   |
| Coss                                                                     | Output Capacitance               |                                    | --  | 160 | --  | pF   |
| Crss                                                                     | Reverse Transfer Capacitance     |                                    | --  | 90  | --  | pF   |
| Switching Characteristics                                                |                                  |                                    |     |     |     |      |
| Qg                                                                       | Total Gate Charge                | VDS=10V, ID=6.5A, VGS=4.5V         | --  | 8   | --  | nC   |
| Qgs                                                                      | Gate Source Charge               |                                    | --  | 2.5 | --  | nC   |
| Qgd                                                                      | Gate Drain Charge                |                                    | --  | 3   | --  | nC   |
| td(on)                                                                   | Turn-on Delay Time               | VDD=10V, ID=0.5A, VGS=4.5V, RG=10Ω | --  | 0.5 | --  | nS   |
| tr                                                                       | Turn-on Rise Time                |                                    | --  | 1   | --  | nS   |
| td(off)                                                                  | Turn-Off Delay Time              |                                    | --  | 12  | --  | nS   |
| tf                                                                       | Turn-Off Fall Time               |                                    | --  | 4   | --  | nS   |
| Source- Drain Diode Characteristics                                      |                                  |                                    |     |     |     |      |
| VSD                                                                      | Forward on voltage               | Tj=25°C, Is=6.5A                   | --  | --  | 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 |
| E      | 1.200                         | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                         | 2.550 | 0.089                | 0.100 |
| e      | 0.950TYP                      |       | 0.037TYP             |       |
| e1     | 1.800                         | 2.000 | 0.071                | 0.079 |
| L      | 0.550REF                      |       | 0.022REF             |       |
| L1     | 0.300                         | 0.500 | 0.012                | 0.020 |
| θ      | 0°                            | 8°    | 0°                   | 8°    |