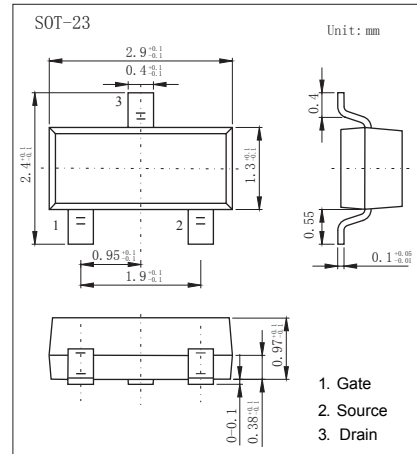
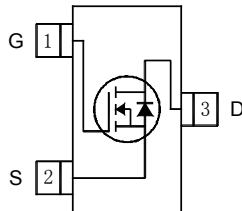


## N-Channel MOSFET IRLML2502

■ Features

- $V_{DS} (V) = 20V$
- $I_D = 4.2 A$
- $R_{DS(ON)} < 45m\ \Omega$  ( $V_{GS} = 4.5V$ )
- $R_{DS(ON)} < 80m\ \Omega$  ( $V_{GS} = 2.5V$ )
- Fast Switching

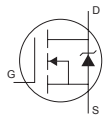


■ Absolute Maximum Ratings  $T_a = 25^\circ C$

| Parameter                               | Symbol     | Rating           | Unit         |   |
|---|------------|------------------|--------------|---|
| Drain-Source Voltage                    | $V_{DS}$   | 20               | V            |   |
| Gate-Source Voltage                     | $V_{GS}$   | $\pm 12$         |              |   |
| Continuous Drain Current                | $I_D$      | $T_a=25^\circ C$ | 4.2          | A |
|   |            | $T_a=70^\circ C$ | 3.4          |   |
| Pulsed Drain Current                    | $I_{DM}$   | 33               |              |   |
| Power Dissipation                       | $P_D$      | $T_a=25^\circ C$ | 1.25         | W |
|   |            | $T_a=70^\circ C$ | 0.8          |   |
| Linear Derating Factor                  |            | 0.01             | $W/^\circ C$ |   |
| Thermal Resistance.Junction- to-Ambient | $R_{thJA}$ | 100              | $^\circ C/W$ |   |
| Junction Temperature                    | $T_J$      | 150              | $^\circ C$   |   |
| Storage Temperature Range               | $T_{stg}$  | -55 to 150       |              |   |

## N-Channel MOSFET IRLML2502

■ Electrical Characteristics Ta = 25°C

| Parameter                          | Symbol              | Test Conditions   | Min | Typ | Max  | Unit |
|------------------------------------|---------------------|---|-----|-----|------|------|
| Drain-Source Breakdown Voltage     | V <sub>DSS</sub>    | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V  | 20  |     |      | V    |
| Zero Gate Voltage Drain Current    | I <sub>DSS</sub>    | V <sub>D</sub> =16V, V <sub>GS</sub> =0V  |     |     | 1    | μA   |
|                                    |                     | V <sub>D</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =70°C  |     |     | 25   |      |
| Gate-Body Leakage Current          | I <sub>GSS</sub>    | V <sub>D</sub> =0V, V <sub>GS</sub> =±12V   |     |     | ±100 | nA   |
| Gate Threshold Voltage             | V <sub>GS(th)</sub> | V <sub>D</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μ A   | 0.5 |     | 1    | V    |
| Static Drain-Source On-Resistance  | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.2A   |     |     | 45   | mΩ   |
|                                    |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.6A   |     |     | 80   |      |
| Forward Transconductance           | g <sub>FS</sub>     | V <sub>D</sub> =10V, I <sub>D</sub> =4A   | 5.8 |     |      | S    |
| Input Capacitance                  | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>D</sub> =15V, f=1MHz  |     | 740 |      | pF   |
| Output Capacitance                 | C <sub>oss</sub>    |   |     | 90  |      |      |
| Reverse Transfer Capacitance       | C <sub>rss</sub>    |   |     | 66  |      |      |
| Total Gate Charge                  | Q <sub>g</sub>      | V <sub>GS</sub> =5V, V <sub>D</sub> =10V, I <sub>D</sub> =4A  |     |     | 12   | nC   |
| Gate Source Charge                 | Q <sub>gs</sub>     |   |     |     | 2.7  |      |
| Gate Drain Charge                  | Q <sub>gd</sub>     |   |     |     | 2.6  |      |
| Turn-On DelayTime                  | t <sub>d(on)</sub>  | V <sub>DD</sub> =10V, I <sub>D</sub> =1 A , R <sub>L</sub> =6 Ω ,R <sub>GEN</sub> =10 Ω   |     | 7.5 |      | ns   |
| Turn-On Rise Time                  | t <sub>r</sub>      |   |     | 10  |      |      |
| Turn-Off DelayTime                 | t <sub>d(off)</sub> |   |     | 54  |      |      |
| Turn-Off Fall Time                 | t <sub>f</sub>      |   |     | 26  |      |      |
| Body Diode Reverse Recovery Time   | t <sub>rr</sub>     | I <sub>F</sub> = 1.3A, di/dt= 100A/μs ,T <sub>J</sub> = 25°C  |     |     | 24   | nC   |
| Body Diode Reverse Recovery Charge | Q <sub>rr</sub>     |   |     |     | 13   |      |
| Continuous Source Current          | I <sub>S</sub>      | MOSFET symbol showing the integral reverse p-n junction diode.  |     |     | 1.3  | A    |
| Pulsed Source Current              | I <sub>SM</sub>     |   |     |     | 33   |      |
| Diode Forward Voltage              | V <sub>SD</sub>     | I <sub>S</sub> =1.3A, V <sub>GS</sub> =0V ,T <sub>J</sub> = 25°C  |     |     | 1.2  | V    |

■ Marking

|         |      |
|---------|------|
| Marking | 1G** |
|---------|------|

## N-Channel MOSFET IRLML2502

■ Typical Characteristics

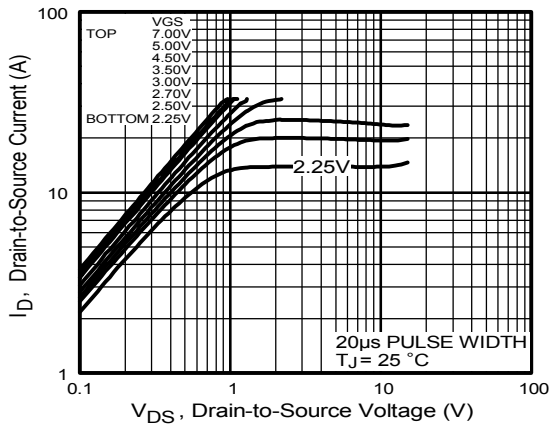


Fig 1. Typical Output Characteristics

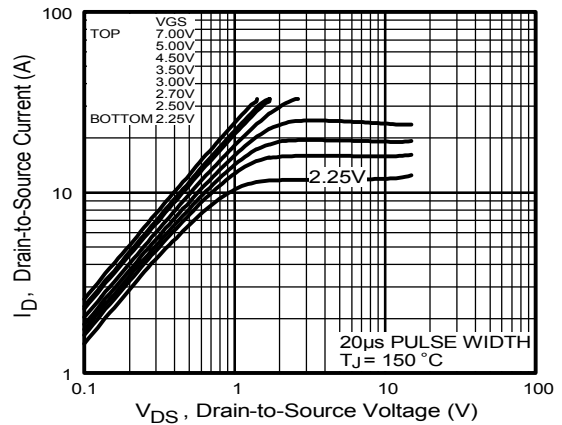


Fig 2. Typical Output Characteristics

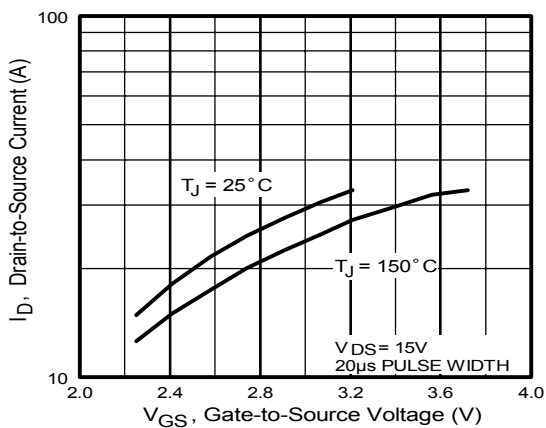


Fig 3. Typical Transfer Characteristics

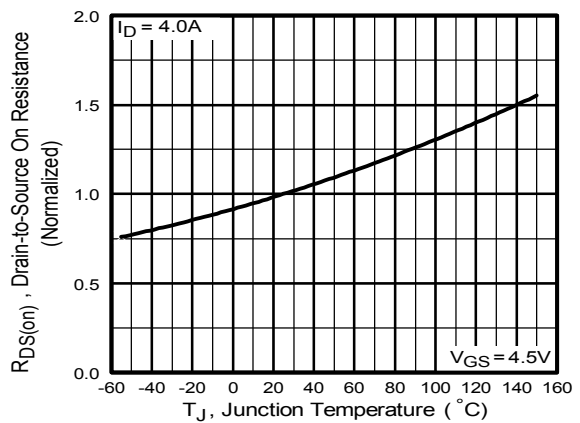


Fig 4. Normalized On-Resistance Vs. Temperature

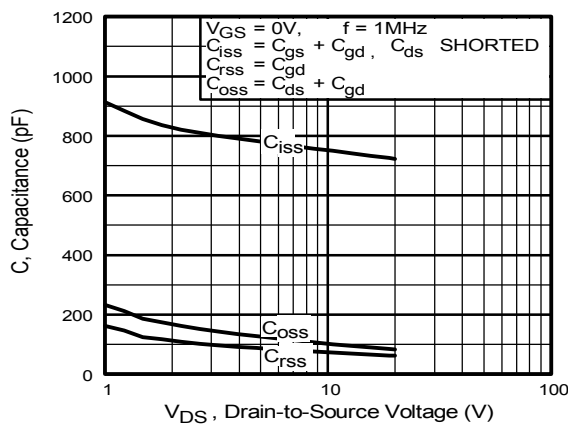


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

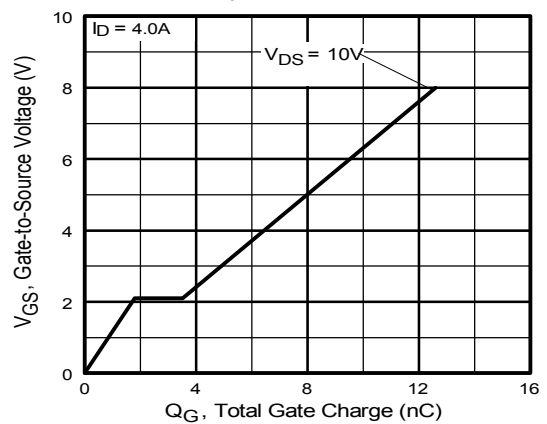
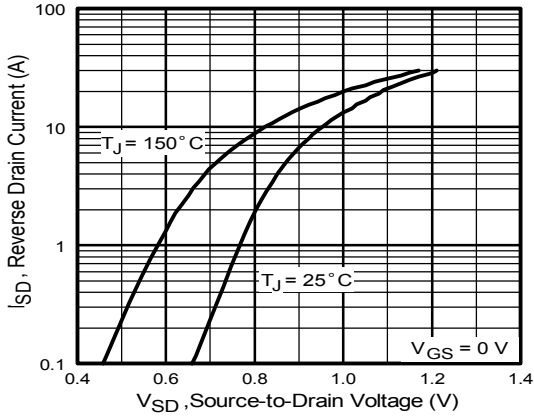


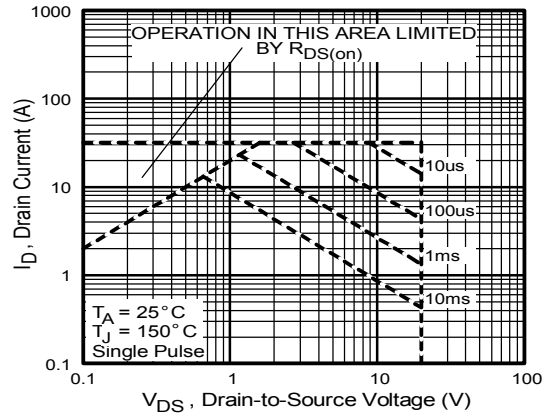
Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

## N-Channel MOSFET IRLML2502

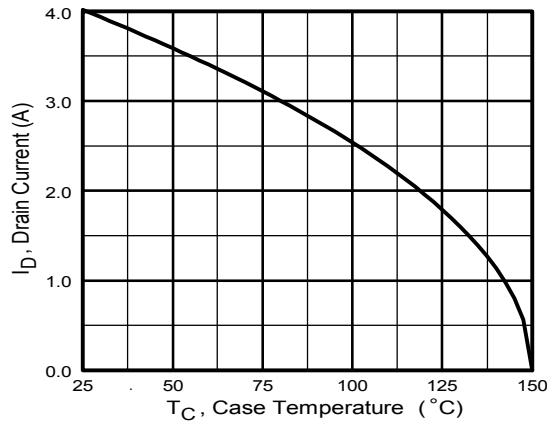
■ Typical Characteristics



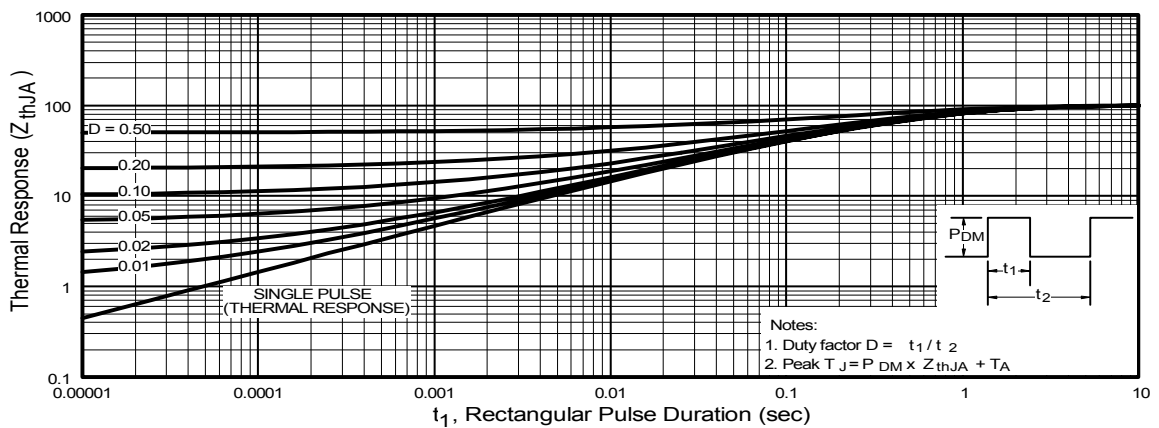
**Fig 7.** Typical Source-Drain Diode Forward Voltage



**Fig 8.** Maximum Safe Operating Area



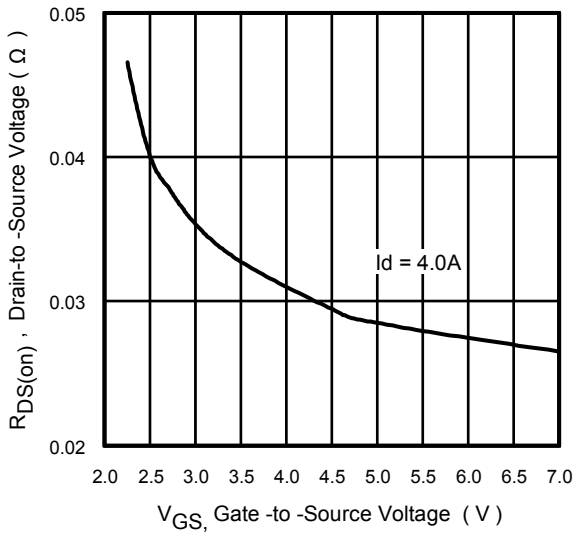
**Fig 9.** Maximum Drain Current Vs. Case Temperature



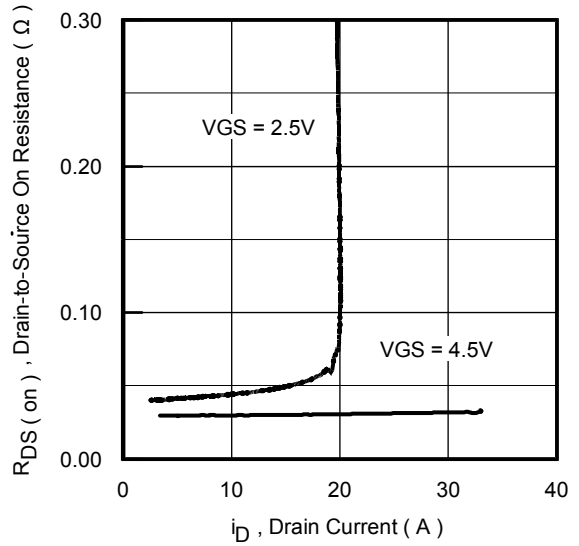
**Fig 10.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

**N-Channel MOSFET  
IRLML2502**

■ Typical Characteristics



**Fig 11.** On-Resistance Vs. Gate Voltage



**Fig 12.** On-Resistance Vs. Drain Current