

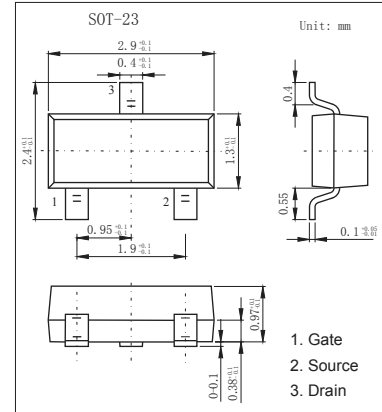
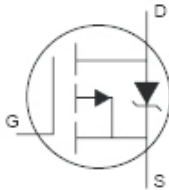


SOT-23 Plastic-Encapsulate MOSFETS

IRLML6401 P-Channel Enhancement MOSFET

■ Features

- Ultra low on-resistance.
- P-Channel MOSFET.
- Fast switching.



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

| Parameter | Symbol | Rating | Unit |
|---|------------|------------|---------------------------|
| Drain-Source Voltage | V_{DS} | -12 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | |
| Continuous Drain Current $V_{GS}=4.5V @ T_A=25^\circ\text{C}$ | I_D | -4.3 | A |
| Continuous Drain Current $V_{GS}=4.5V @ T_A=70^\circ\text{C}$ | | -3.4 | |
| Pulsed Drain Current a | | I_{DM} | |
| Power Dissipation @ $T_A=25^\circ\text{C}$ | P_D | 1.3 | W |
| Power Dissipation @ $T_A=70^\circ\text{C}$ | | 0.8 | |
| Single Pulse Avalanche Energy b | E_{AS} | 33 | mJ |
| Thermal Resistance.Junction- to-Ambient | R_{thJA} | 100 | $^\circ\text{C}/\text{W}$ |
| Linera Derating Factor | | 0.01 | $\text{W}/^\circ\text{C}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Junction and Storage Temperature Range | T_{stg} | -55 to 150 | |

Notes:

- a.Repetitive Rating :Pulse width limited by maximum junction temperature
- b.Starting $T_J=25^\circ\text{C}$, $L=3.5\text{mH}$, $R_G=25\Omega$, $I_{AS}=-4.3\text{A}$

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■ Electrical Characteristics Ta = 25°C

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------------|---------------------|--|---------------------------------------|-------|-------|------|
| Drain-Source Breakdown Voltage | V _{DSS} | I _D =-250 μA, V _{GS} =0V | -12 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-12V, V _{GS} =0V | | | -1 | μA |
| | | V _{DS} =-9.6V, V _{GS} =0V, T _J = 55°C | | | -25 | |
| Gate-Body leakage current | I _{GSS} | V _{DS} =0V, V _{GS} =±8V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} I _D =-250 μA | -0.4 | -0.55 | -0.95 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =-4.5V, I _D =-4.3A | | | 50 | mΩ |
| | | V _{GS} =-2.5V, I _D =-2.5A | | | 85 | |
| | | V _{GS} =-1.8V, I _D =-2A | | | 125 | |
| Forward Transconductance | g _{FS} | V _{DS} =-10V, I _D =-4.3A | 8.6 | | | S |
| Input Capacitance | C _{iss} | V _{GS} =0V, V _{DS} =-10V, f=1MHz | | 830 | | pF |
| Output Capacitance | C _{oss} | | | 180 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 125 | | |
| Total Gate Charge | Q _g | V _{GS} =-5.0V, V _{DS} =-10V, I _D =-4.3A | | 10 | 15 | nC |
| Gate Source Charge | Q _{gs} | | | 1.4 | 2.1 | |
| Gate Drain Charge | Q _{gd} | | | 2.6 | 3.9 | |
| Turn-On DelayTime | t _{d(on)} | | | 11 | | |
| Turn-On Rise Time | t _r | I _D =-1.0A, V _{DS} =-6.0V, R _L =6 Ω, R _{GEN} =89 Ω | | 32 | | ns |
| Turn-Off DelayTime | t _{d(off)} | | | 250 | | |
| Turn-Off Fall Time | t _f | | | 210 | | |
| Body Diode Reverse Recovery Time | t _{rr} | | I _F =-1.3A, di/dt=-100A/μs | | 22 | |
| Body Diode Reverse Recovery Charge | Q _{rr} | I _F =-1.3A, di/dt=-100A/μs | | 8 | 12 | Nc |
| Maximum Body-Diode Continuous Current | I _S | | | | 1.3 | A |
| Diode Forward Voltage | V _{SD} | I _S =-1.3A, V _{GS} =0V | | | -1.2 | V |

■ Marking

| | |
|---------|------|
| Marking | 1F * |
|---------|------|

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■ Typical Characteristics

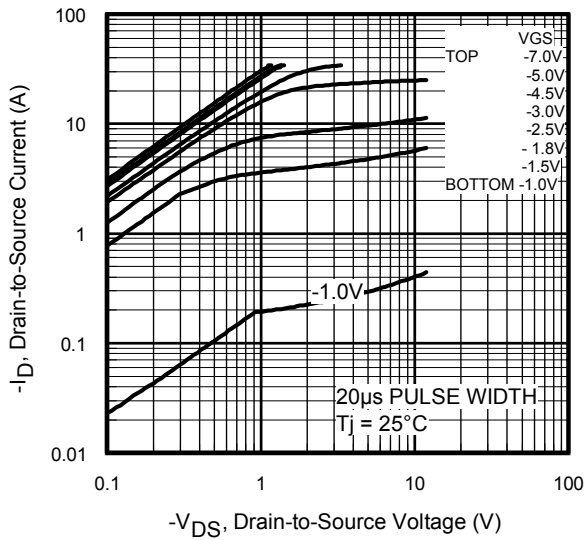


Fig 1. Typical Output Characteristics

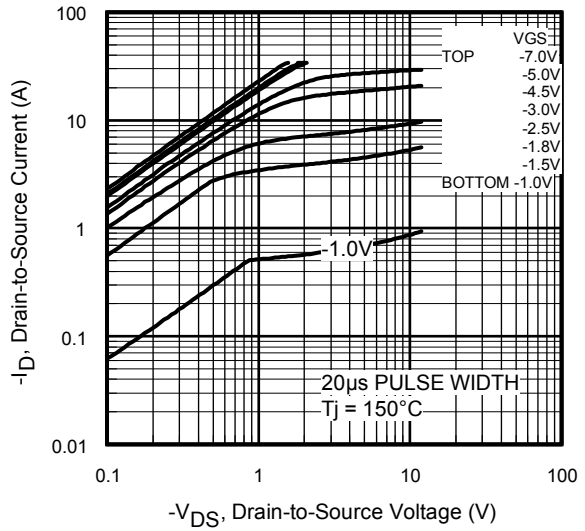


Fig 2. Typical Output Characteristics

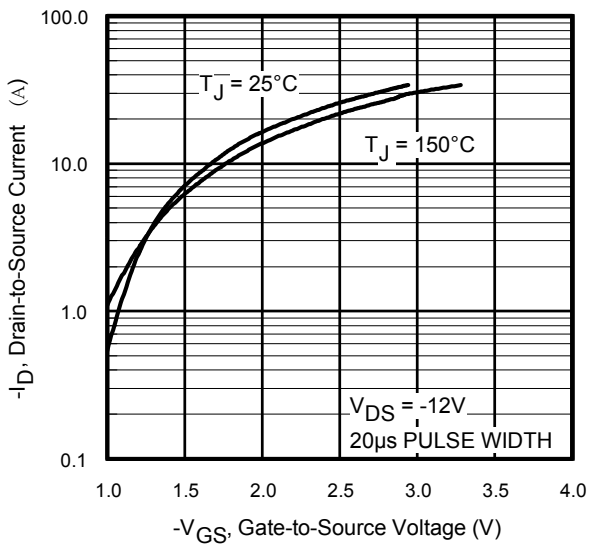


Fig 3. Typical Transfer Characteristics

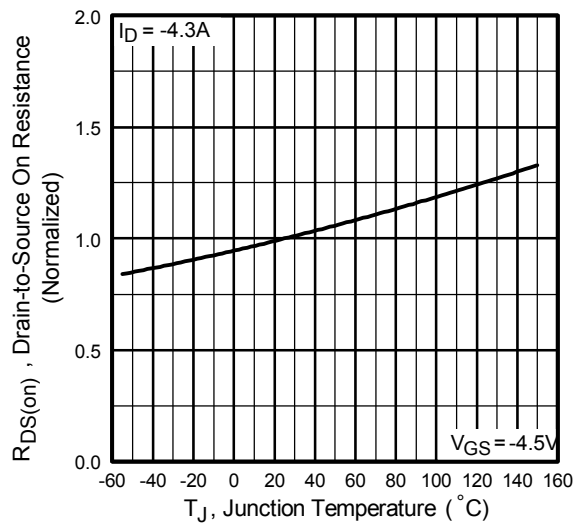


Fig 4. Normalized On-Resistance Vs. Temperature

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■ Typical Characteristics

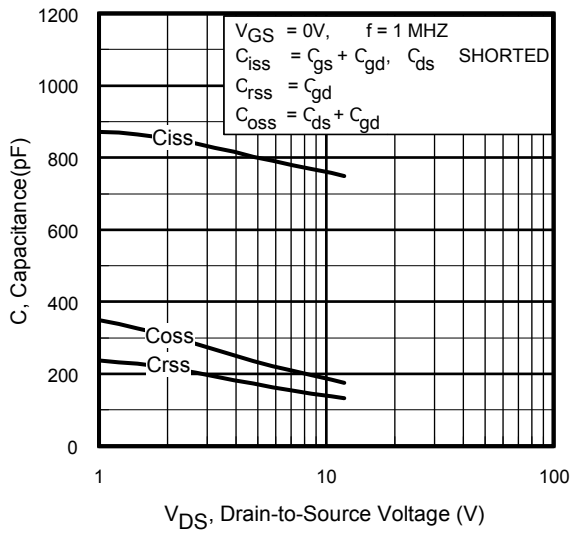


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

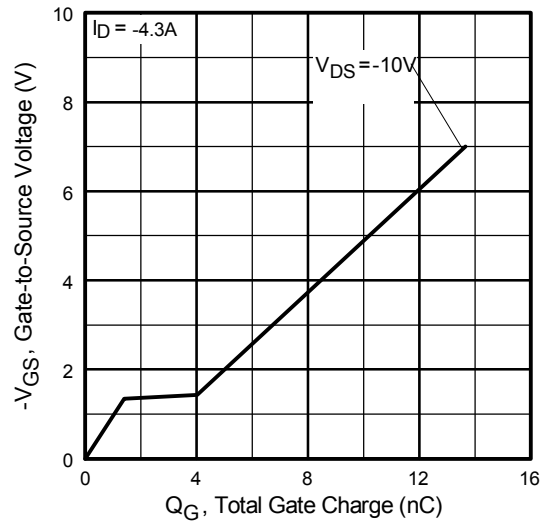


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

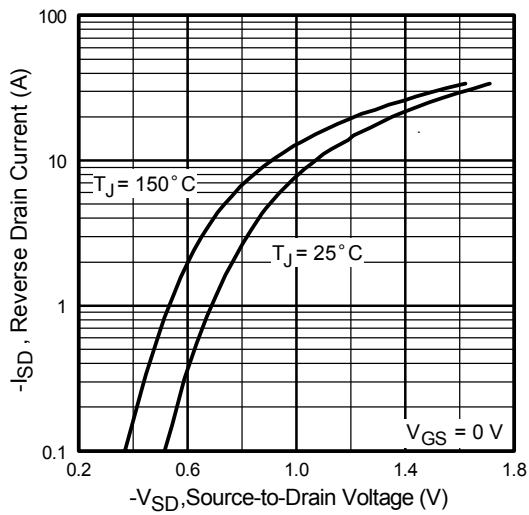


Fig 7. Typical Source-Drain Diode Forward Voltage

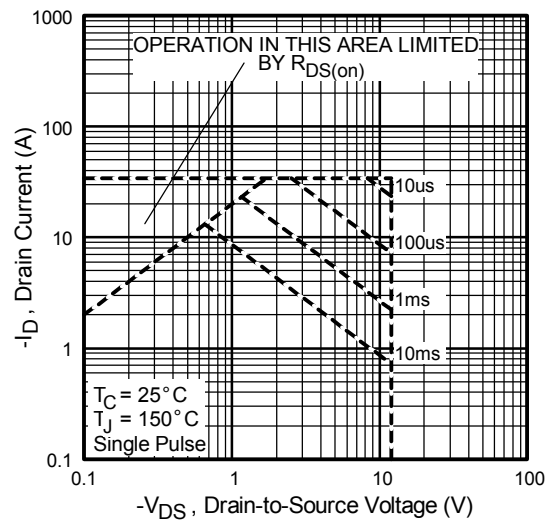


Fig 8. Maximum Safe Operating Area

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