

P-Channel MOSFET

IRF9540 (KRF9540)

■ Electrical Characteristics Ta = 25°C

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------------|---------------------|---------------------------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage | V _{DSS} | I _D =-250μA, V _{GS} =0V | -100 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _D =-100V, V _{GS} =0V | | | -100 | μA |
| | | V _D =-80V, V _{GS} =0V, T _J =150°C | | | -500 | |
| Gate-Body leakage current | I _{GSS} | V _D =0V, V _{GS} =±20V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _D =V _{GS} , I _D =-250 μ A | -2 | | -4 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =-10V, I _D =-11A | | | 200 | mΩ |
| Forward Transconductance | g _{FS} | V _D =-50V, I _D =-11A | 6.2 | | | S |
| Input Capacitance | C _{iss} | V _{GS} =0V, V _D =-25V, f=1MHz | | 1400 | | pF |
| Output Capacitance | C _{oss} | | | 590 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 140 | | |
| Total Gate Charge | Q _g | V _{GS} =-10V, V _D =-80V, I _D =-19A | | | 61 | nC |
| Gate Source Charge | Q _{gs} | | | | 14 | |
| Gate Drain Charge | Q _{gd} | | | | 29 | |
| Turn-On DelayTime | t _{d(on)} | V _{DD} =-50V, I _D =-19A, R _g =9.1Ω, R _D =2.4Ω, | | 16 | | ns |
| Turn-On Rise Time | t _r | | | 73 | | |
| Turn-Off DelayTime | t _{d(off)} | | | 34 | | |
| Turn-Off Fall Time | t _f | | | 57 | | |
| Body Diode Reverse Recovery Time | t _{rr} | I _F =-19A, di/dt=100A/μs, T _J =25°C | | | 260 | nC |
| Body Diode Reverse Recovery Charge | Q _{rr} | | | | 700 | |
| Internal Drain Inductance | L _D | Between lead, 6 mm (0.25") from package and center of die contact | | 4.5 | | nH |
| Internal Source Inductance | L _S | | | 7.5 | | |
| Continuous Source-Drain Diode Current | I _S | MOSFET symbol showing the integral reverse p - n junction diode | | | -19 | A |
| Pulsed Diode Forward Current | I _{SM} | | | | -72 | |
| Diode Forward Voltage | V _{SD} | I _S =-19A, V _{GS} =0V, T _J =25°C | | | -5 | V |

Note.Pulse width ≤ 300μs; duty cycle ≤ 2 %.

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■ Typical Characteristics

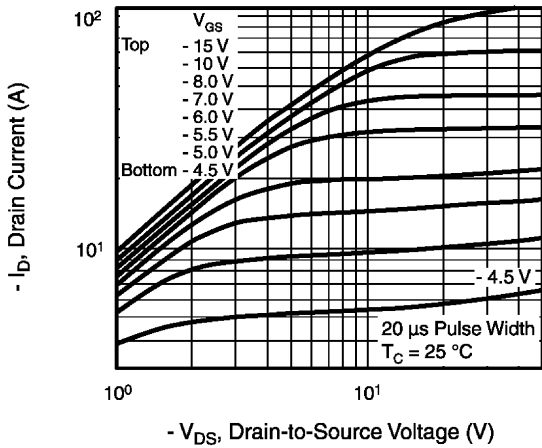


Fig. 1 - Typical Output Characteristics, $T_C = 25\text{ }^\circ\text{C}$

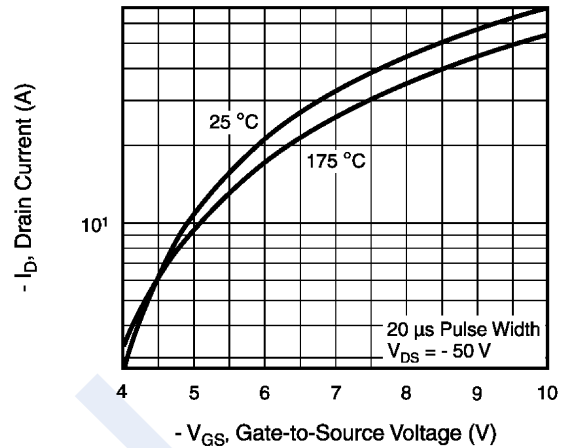


Fig. 3 - Typical Transfer Characteristics

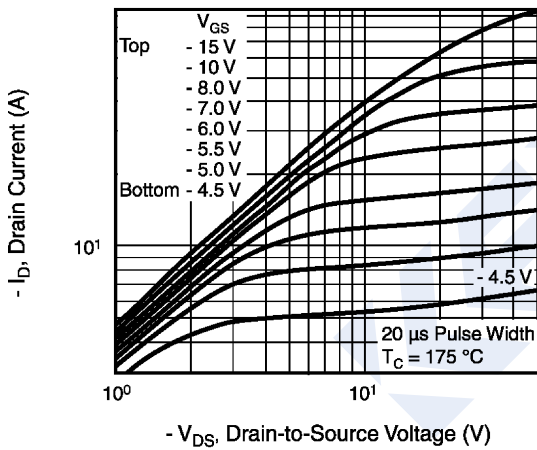


Fig. 2 - Typical Output Characteristics, $T_C = 175\text{ }^\circ\text{C}$

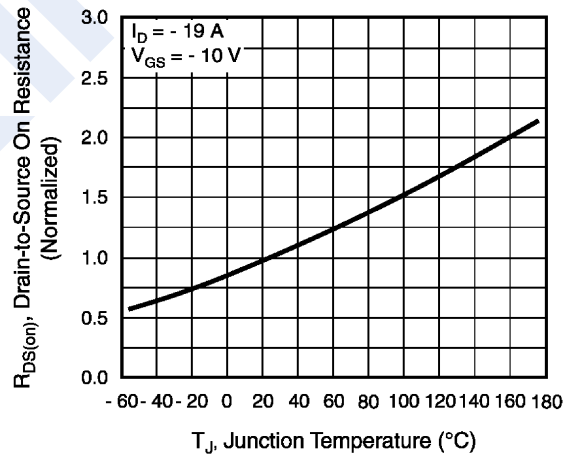


Fig. 4 - Normalized On-Resistance vs. Temperature

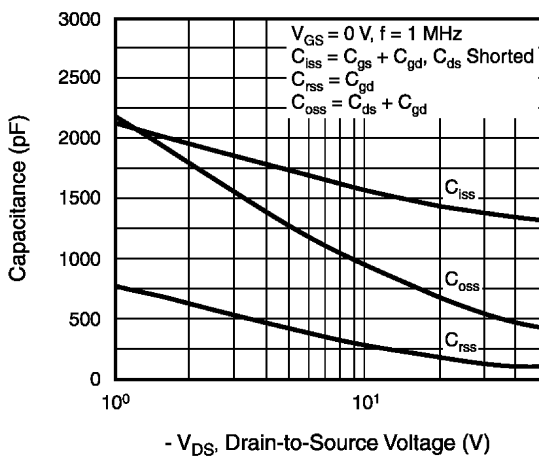


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

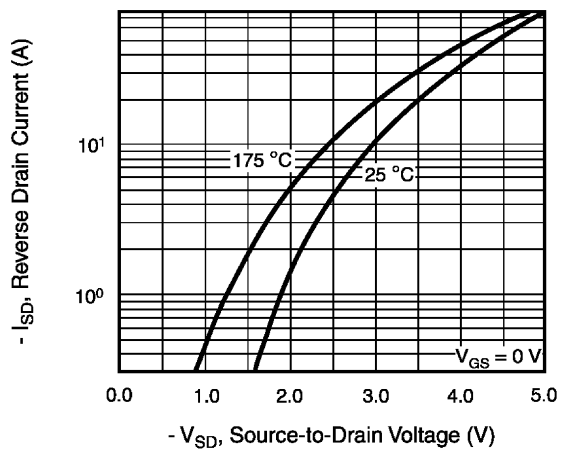


Fig. 7 - Typical Source-Drain Diode Forward Voltage

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■ Typical Characteristics

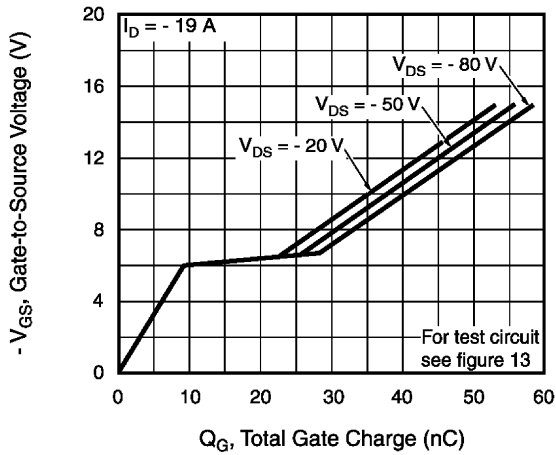


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

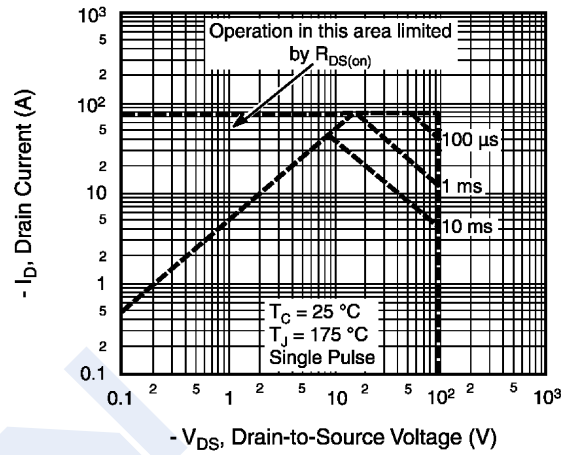


Fig. 8 - Maximum Safe Operating Area

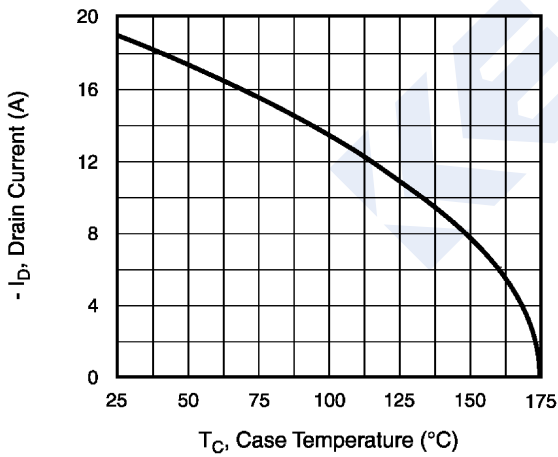


Fig. 9 - Maximum Drain Current vs. Case Temperature

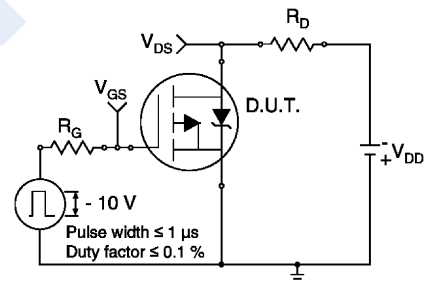


Fig. 10a - Switching Time Test Circuit

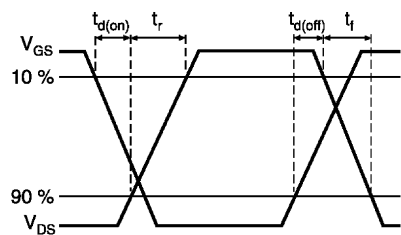


Fig. 10b - Switching Time Waveforms

P-Channel MOSFET IRF9540 (KRF9540)

■ Typical Characteristics

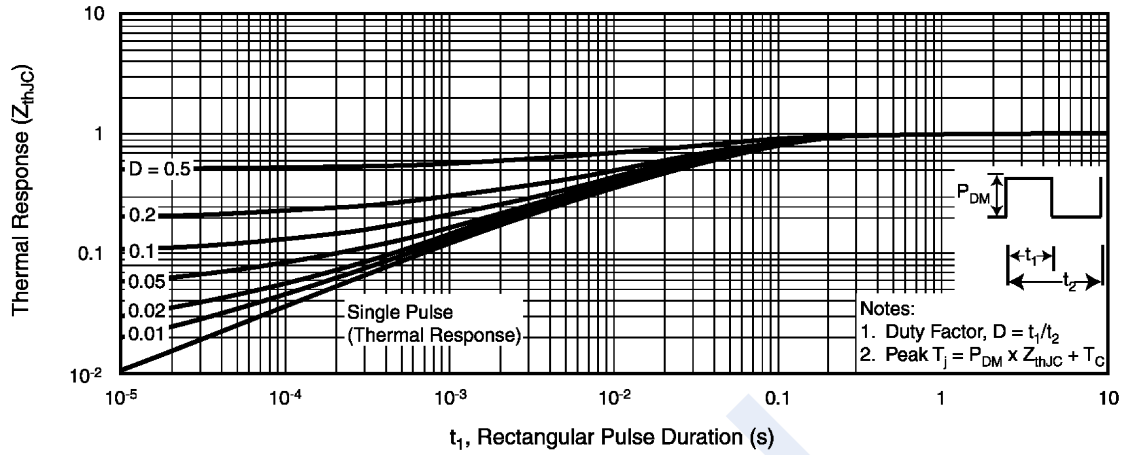


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

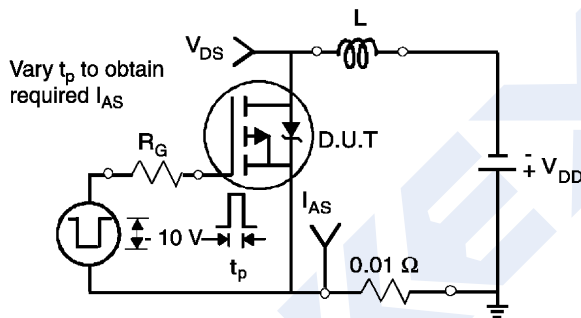


Fig. 12a - Unclamped Inductive Test Circuit

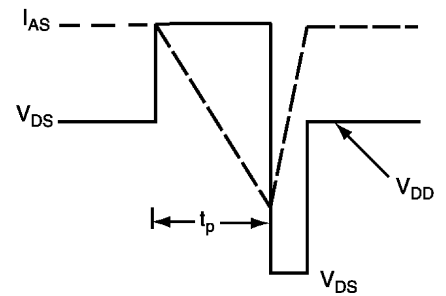


Fig. 12b - Unclamped Inductive Waveforms

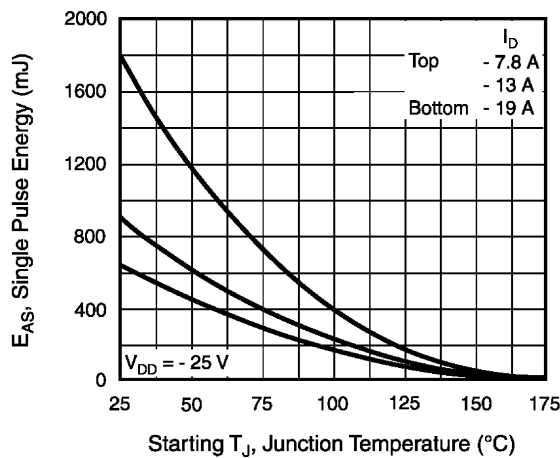


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

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■ Typical Characteristics

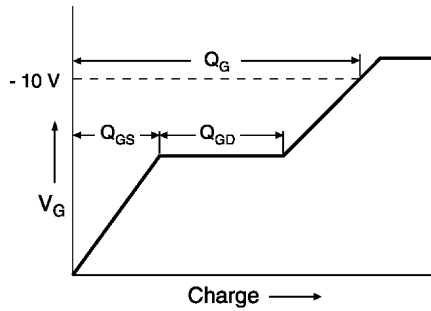


Fig. 13a - Basic Gate Charge Waveform

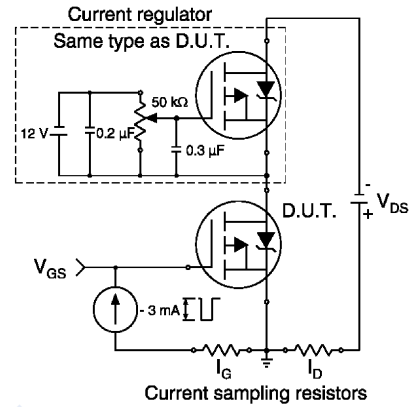


Fig. 13b - Gate Charge Test Circuit

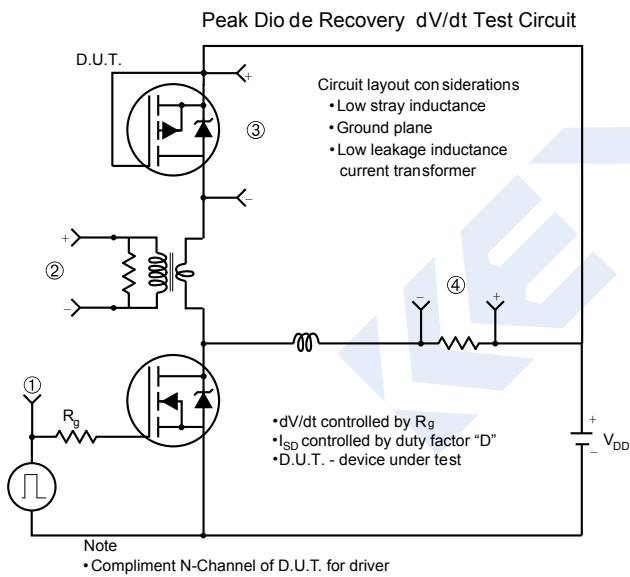
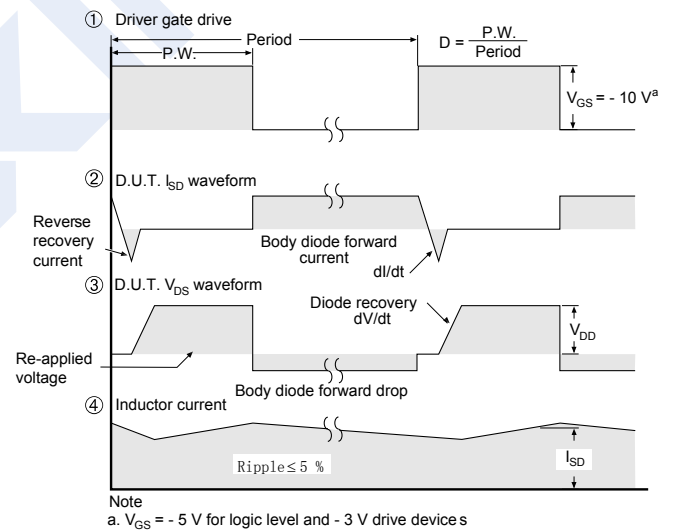


Fig. 14 - For P-Channel



Note
a. $V_{GS} = -5V$ for logic level and $-3V$ drive devices