

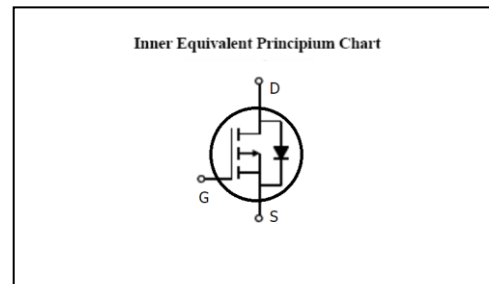
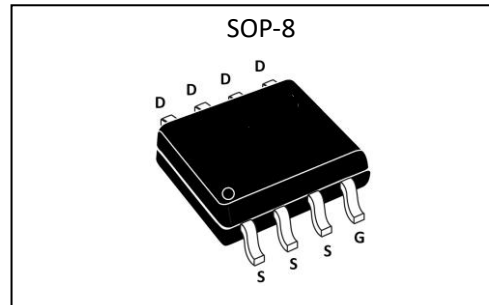
Features:

- $R_{DS(ON)} < 55m\Omega$ @ $V_{GS} = -10V$ (Typ 43m Ω)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

| | | |
|------------------|------|------------|
| V_{DSS} | -30 | V |
| I_D | -5.1 | A |
| P_D | 2.5 | W |
| $R_{DS(ON)type}$ | 43 | m Ω |

Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



Absolute ($T_c = 25^\circ C$ unless otherwise specified) :

| Symbol | Parameter | Rating | Units |
|----------------|--|-----------------|------------|
| V_{DSS} | Drain-to-Source Voltage | -30 | V |
| I_D | Continuous Drain Current | -5.1 | A |
| I_{DM} | Pulsed Drain Current | -20 | A |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| P_D | Power Dissipation | 2.5 | W |
| T_J, T_{stg} | Operating Junction and Storage Temperature Range | 155, -55 to 155 | $^\circ C$ |

Electrical Characteristics (T_c= 25°C unless otherwise specified) :

| OFF Characteristics | | | | | | |
|---------------------|-----------------------------------|---|--------|------|------|-------|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| V _{DSS} | Drain to Source Breakdown Voltage | V _{GS} =0V, I _D =-250μA | -30 | -- | -- | V |
| I _{DSS} | Drain to Source Leakage Current | V _{DS} =-24V, V _{GS} = 0V, T _a =25°C | -- | -- | -1.0 | μA |
| I _{GSS(F)} | Gate to Source Forward Leakage | V _{GS} = +20V | -- | -- | 0.1 | μA |
| I _{GSS(R)} | Gate to Source Reverse Leakage | V _{GS} = -20V | -- | -- | -0.1 | μA |

| ON Characteristics ^{a3} | | | | | | |
|----------------------------------|-------------------------------|---|--------|------|------|-------|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| R _{DS(ON)} | Drain-to-Source On-Resistance | V _{GS} =-10V, I _D =-5.1A | -- | 43 | 55 | mΩ |
| | | V _{GS} =-4.5V, I _D =-4.2A | -- | 62 | 90 | mΩ |
| V _{GS(TH)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250μA | -1.0 | -- | -3.0 | V |
| Pulse width tp ≤ 380μs, δ ≤ 2% | | | | | | |

| Dynamic Characteristics ^{a4} | | | | | | |
|---------------------------------------|------------------------------|--|--------|------|------|-------|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| g _{fs} | Forward Transconductance | V _{DS} =-15V, I _D =-5.1A | -- | 7 | -- | S |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =-15V f=1.0MHz | -- | 980 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 390 | -- | |
| C _{rss} | Reverse Transfer Capacitance | | -- | 135 | -- | |

| Resistive Switching Characteristics ^{a4} | | | | | | |
|---|----------------------------------|---|--------|------|------|-------|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| t _{d(ON)} | Turn-on Delay Time | V _{DD} =-15V, I _D =-1A V _{GS} =-10V, R _G =6Ω | -- | 14 | -- | ns |
| t _r | Rise Time | | -- | 12 | -- | |
| t _{d(OFF)} | Turn-Off Delay Time | | -- | 56 | -- | |
| t _f | Fall Time | | -- | 20 | -- | |
| Q _g | Total Gate Charge | V _{DD} =-15V, I _D =-5.1A V _{GS} =-10V | -- | 11 | -- | nC |
| Q _{gs} | Gate to Source Charge | | -- | 2.0 | -- | |
| Q _{gd} | Gate to Drain ("Miller")Charge | | -- | 2.8 | -- | |

| Source-Drain Diode Characteristics | | | | | | |
|------------------------------------|--|----------------------------|--------|------|------|-------|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| I_S | Continuous Source Current ^{a2} (Body Diode) | | -- | -- | -5.1 | A |
| V_{SD} | Diode Forward Voltage ^{a3} | $I_S = -2.1A, V_{GS} = 0V$ | -- | -- | -1.2 | V |

| Symbol | Parameter | Typ. | Units |
|-----------------|--------------------------------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case ^{a2} | 50 | °C/W |

^{a1}: Repetitive Rating: Pulse width limited by maximum junction temperature.

^{a2}: Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

^{a3}: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

^{a4}: Guaranteed by design, not subject to production

Test circuit & Thermal Characteristics

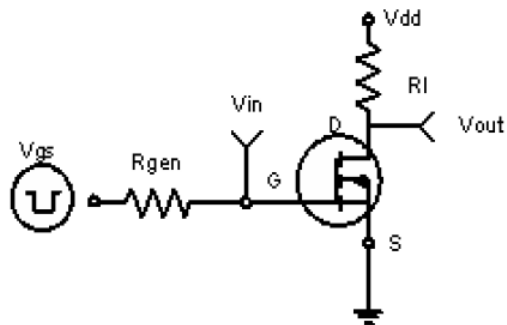


Figure 1: Switching Test Circuit

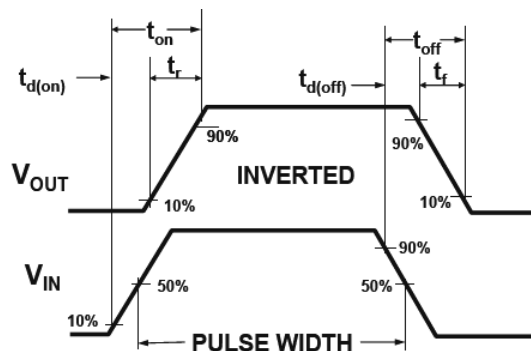


Figure 2: Switching Waveforms

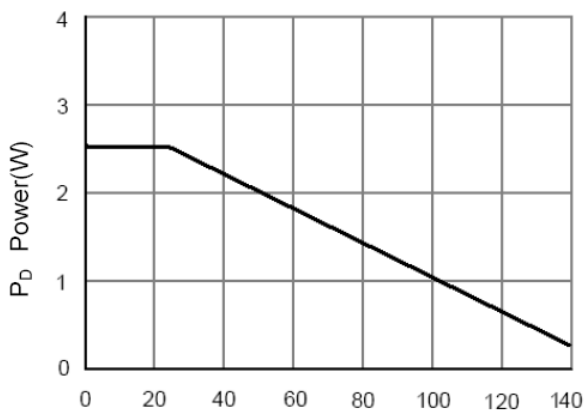


Figure 3 Power Dissipation

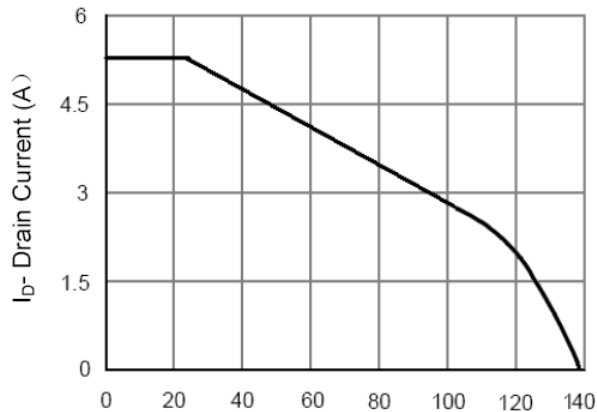


Figure 4 Drain Current

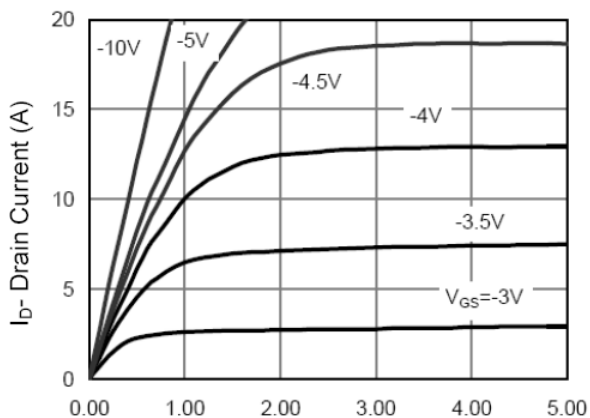


Figure 5 Output Characteristics

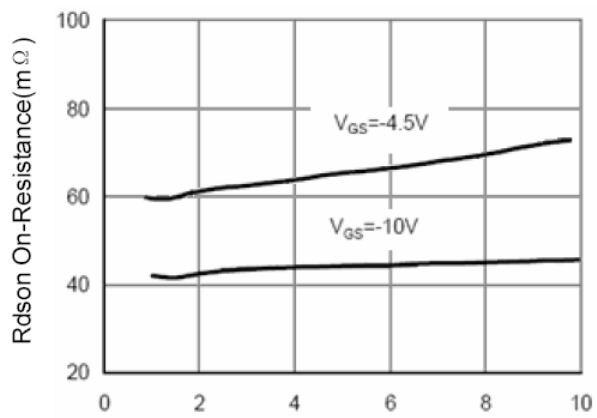


Figure 6 Drain-Source On-Resistance

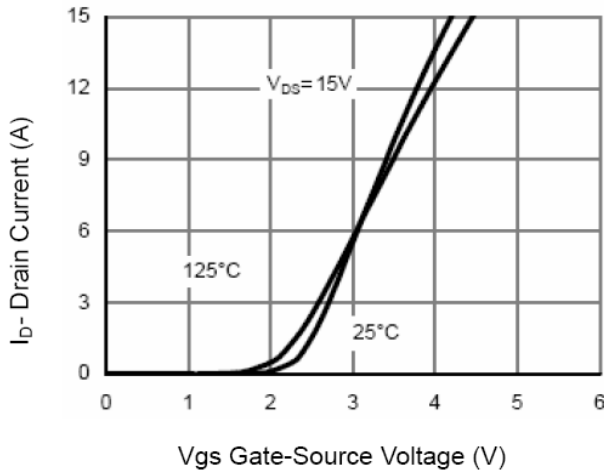


Figure 7 Transfer Characteristics

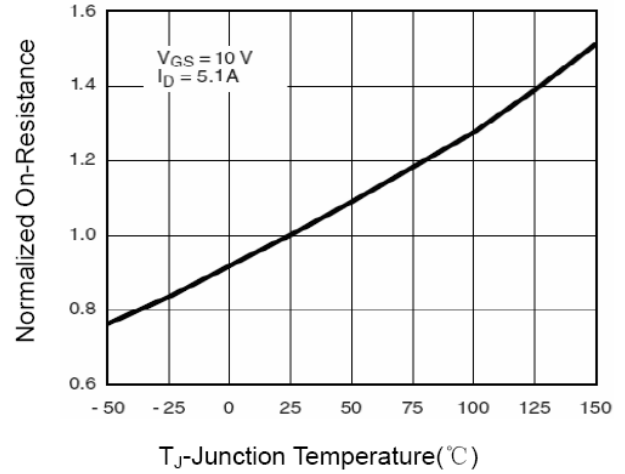


Figure 8 Drain-Source On-Resistance

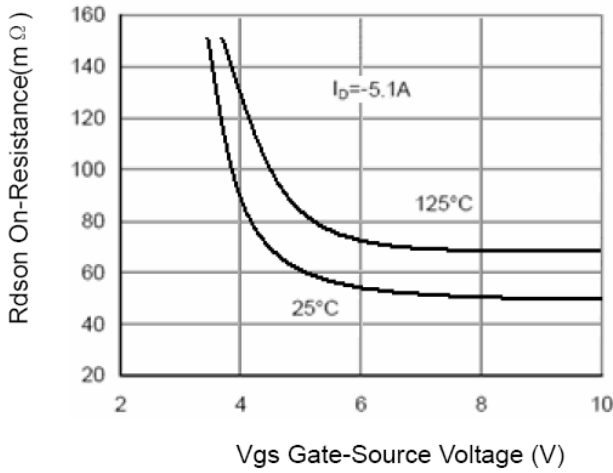


Figure 9 Rdson vs Vgs

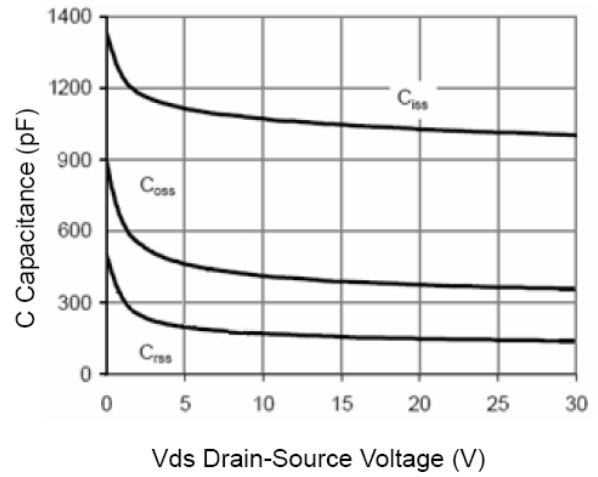


Figure 10 Capacitance vs Vds

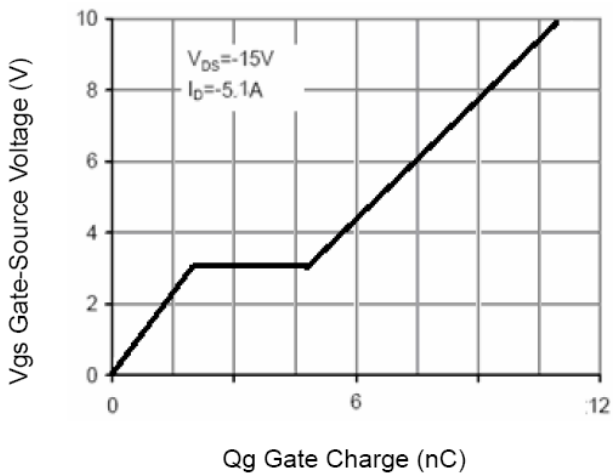


Figure 11 Gate Charge

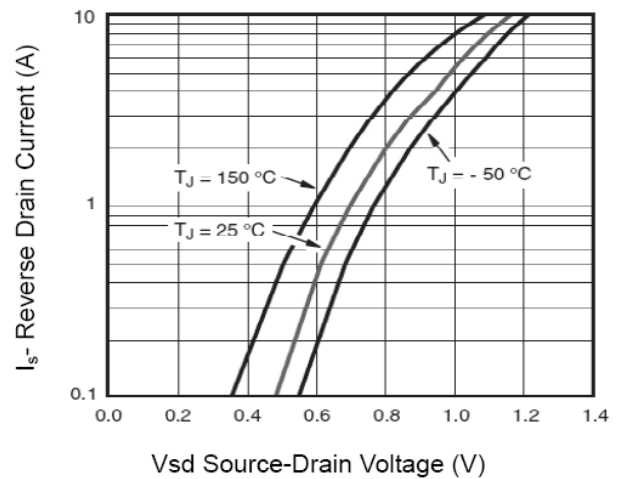


Figure 12 Source- Drain Diode Forward

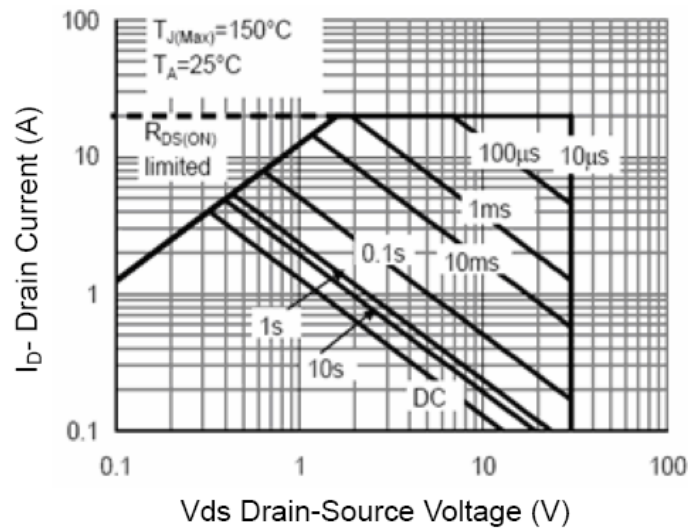


Figure 13 Safe Operation Area

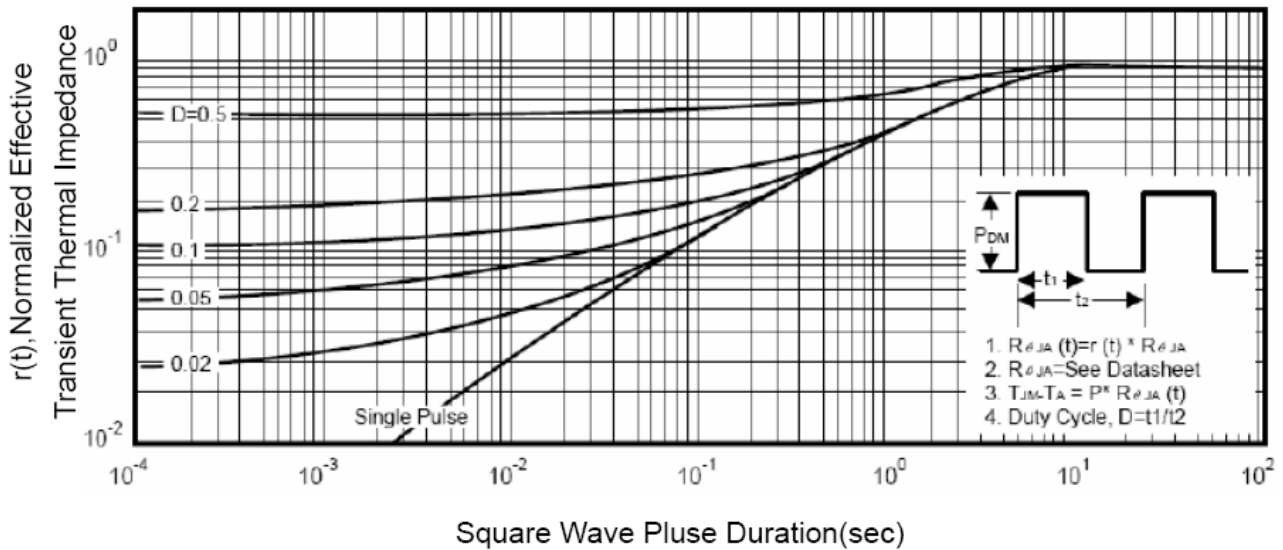


Figure 14 Normalized Maximum Transient Thermal Impedance

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