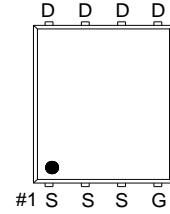
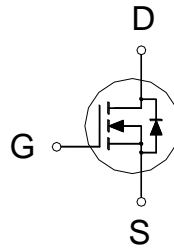




PRODUCT SUMMARY

| | | |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | I_D |
| 40V | 5.5mΩ | 46A |



G. GATE
D. DRAIN
S. SOURCE

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ °C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|--|-----------------------|----------------|------------|-------|
| Drain-Source Voltage | | V_{DS} | 40 | V |
| Gate-Source Voltage | | V_{GS} | ±20 | V |
| Continuous Drain Current ³ | $T_C = 25\text{ °C}$ | I_D | 52 | A |
| | $T_C = 100\text{ °C}$ | | 33 | |
| Pulsed Drain Current ¹ | | I_{DM} | 100 | |
| Continuous Drain Current | $T_A = 25\text{ °C}$ | I_D | 19 | |
| | $T_A = 70\text{ °C}$ | | 15 | |
| Avalanche Current | | I_{AS} | 35 | |
| Avalanche Energy | $L = 0.1\text{mH}$ | E_{AS} | 61 | mJ |
| Power Dissipation | $T_C = 25\text{ °C}$ | P_D | 31 | W |
| | $T_C = 100\text{ °C}$ | | 12.5 | |
| Power Dissipation ⁴ | $T_A = 25\text{ °C}$ | P_D | 4 | W |
| | $T_A = 70\text{ °C}$ | | 2.6 | |
| Operating Junction & Storage Temperature Range | | T_j, T_{stg} | -55 to 150 | °C |

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|----------------------------------|---------------------|-----------------|---------|---------|--------|
| Junction-to-Ambient ² | $t \leq 10\text{s}$ | $R_{\theta JA}$ | | 30 | °C / W |
| Junction-to-Ambient ² | Steady-State | $R_{\theta JA}$ | | 53 | |
| Junction-to-Case | Steady-State | $R_{\theta JC}$ | | 4 | |

¹Pulse width limited by maximum junction temperature.

²The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25\text{ °C}$.

³Package limitation current is 35A.

⁴The Power dissipation is based on $R_{\theta JA} t \leq 10\text{s}$ value.

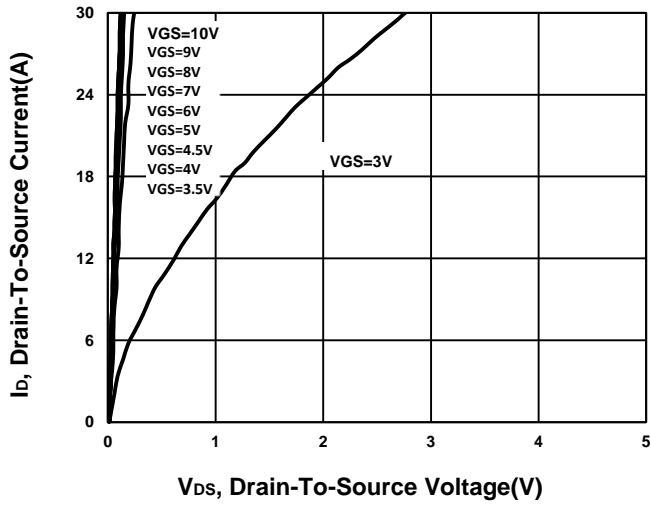
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNIT |
|---|----------------------|--|---|------|------|------|
| | | | MIN | TYP | MAX | |
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = 250μA | 40 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 1.3 | 1.75 | 2.3 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0V, V _{GS} = ±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 32V, V _{GS} = 0V | | | 1 | μA |
| | | V _{DS} = 30V, V _{GS} = 0V, T _J = 55 °C | | | 10 | |
| Drain-Source On-State Resistance ¹ | R _{DS(ON)} | V _{GS} = 4.5V, I _D = 15A | | 4.2 | 7 | mΩ |
| | | V _{GS} = 10V, I _D = 19A | | 3.5 | 5.5 | |
| Forward Transconductance ¹ | g _{fs} | V _{DS} = 5V, I _D = 19A | | 80 | | S |
| DYNAMIC | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0V, V _{DS} = 20V, f = 1MHz | | 2131 | | pF |
| Output Capacitance | C _{oss} | | | 272 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 162 | | |
| Gate Resistance | R _g | V _{GS} = 0V, V _{DS} = 0V, f = 1MHz | | 1.7 | | Ω |
| Total Gate Charge ² | Q _g | V _{GS} = 10V | V _{DS} = 20V, V _{GS} = 10V, I _D = 19A | | 42 | nC |
| | | V _{GS} = 4.5V | | | 22 | |
| Gate-Source Charge ² | Q _{gs} | | | 7 | | |
| Gate-Drain Charge ² | Q _{gd} | | | 10 | | |
| Turn-On Delay Time ² | t _{d(on)} | V _{DS} = 20V, I _D ≅ 19A, V _{GS} = 10V, R _{GEN} = 6Ω | | | 20 | |
| Rise Time ² | t _r | | | 13 | | |
| Turn-Off Delay Time ² | t _{d(off)} | | | 58 | | |
| Fall Time ² | t _f | | | 11 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C) | | | | | | |
| Continuous Current | I _S | | | | 24 | A |
| Forward Voltage ¹ | V _{SD} | I _F = 19A, V _{GS} = 0V | | | 1.3 | V |
| Reverse Recovery Time | t _{rr} | I _F = 19A, dI _F /dt = 100A / μS | | 17 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | 5 | | nC |

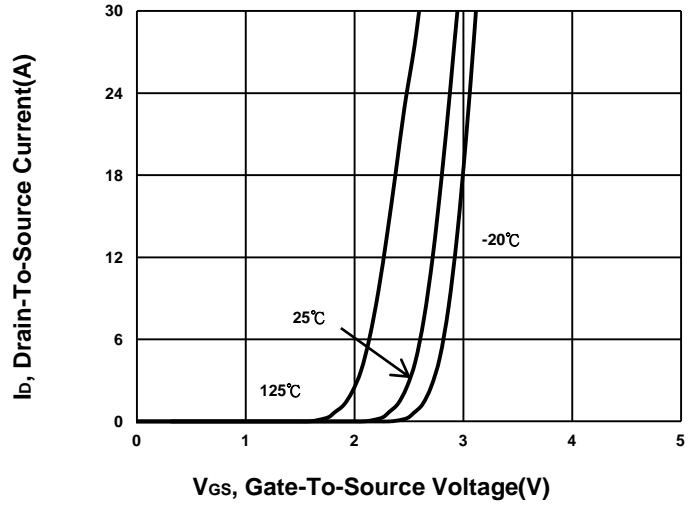
¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

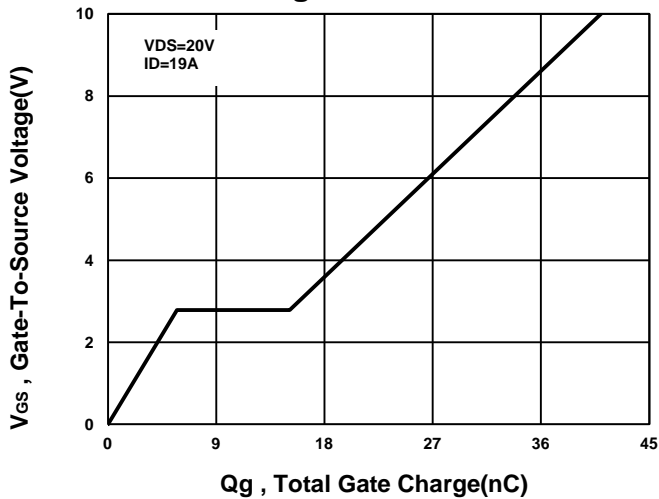
Output Characteristics



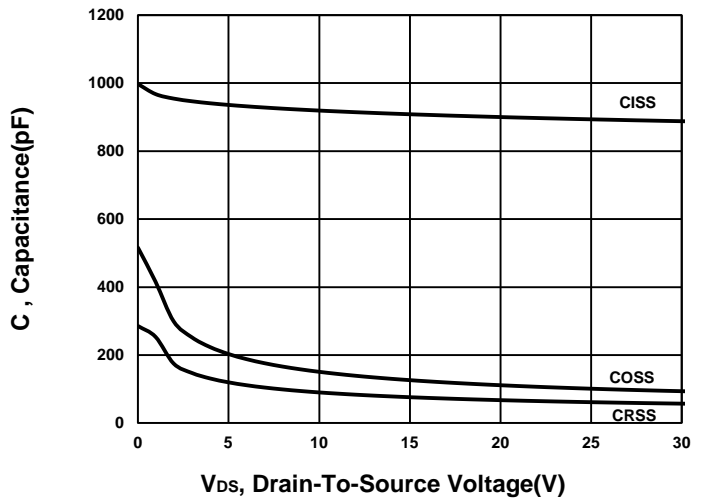
Transfer Characteristics



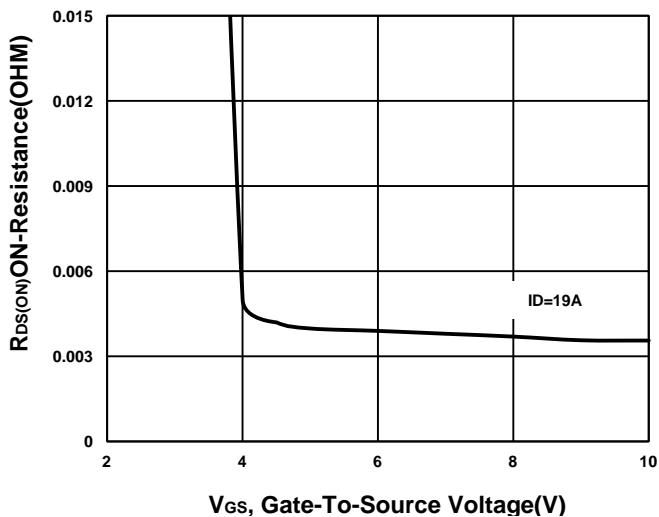
Gate charge Characteristics



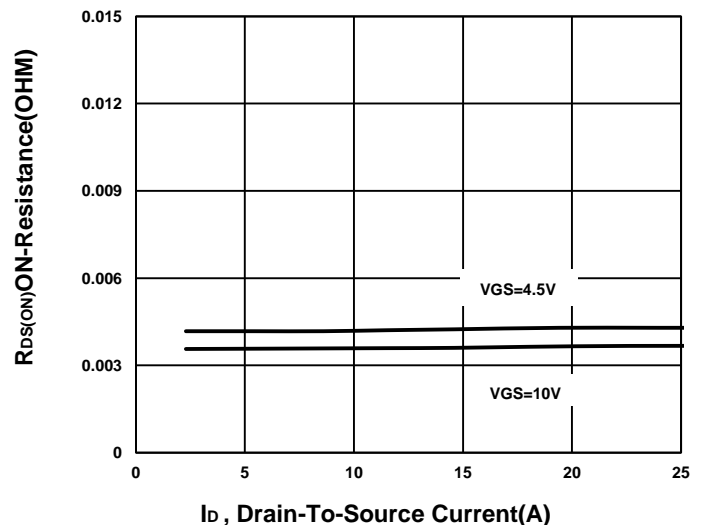
Capacitance Characteristic



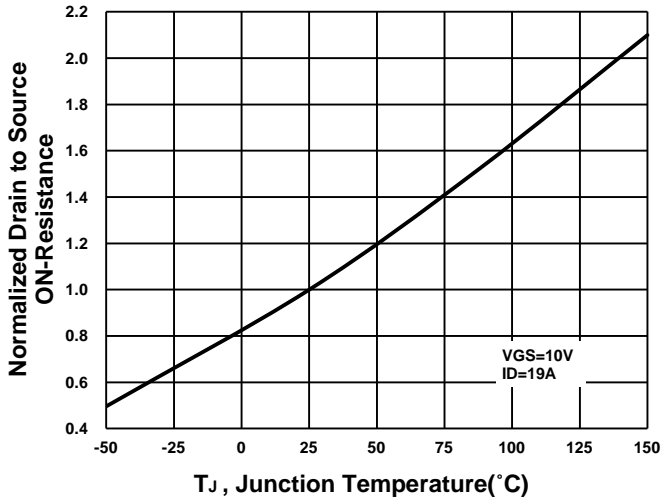
**On-Resistance VS Gate-To-Source
Voltage**



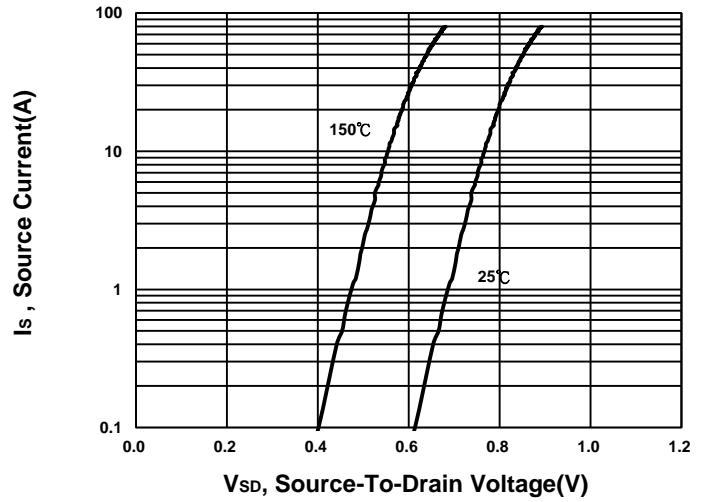
On-Resistance VS Drain Current



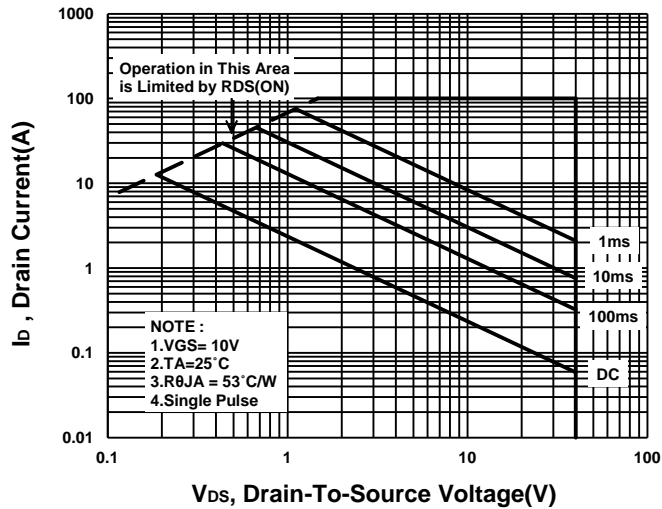
On-Resistance VS Temperature



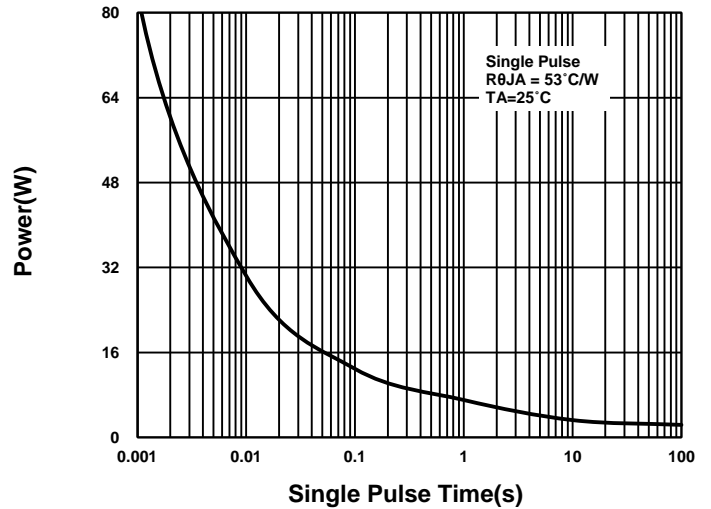
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

