

N-Channel Enhancement Mode Power MOSFET

Description

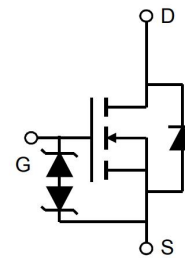
The GT011N03ME uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

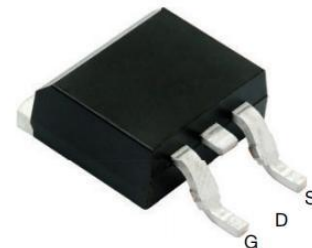
- V_{DS} 30V
- I_D (at $V_{GS} = 10V$) 209A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 1.6m Ω
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 2.0m Ω
- 100% Avalanche Tested
- RoHS Compliant
- ESD (HBM)>8KV

Application

- Power switch
- DC/DC converters



Schematic diagram



TO-263

Ordering Information

| Device | Package | Marking | Packaging |
|------------|---------|----------|-------------|
| GT011N03ME | TO-263 | GT011N03 | 800pcs/Reel |

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

| Parameter | Symbol | Value | Unit |
|--------------------------------------------------|----------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Continuous Drain Current | I_D | 209 | A |
| Pulsed Drain Current (note1) | I_{DM} | 836 | A |
| Gate-Source Voltage | V_{GS} | ± 18 | V |
| Power Dissipation | P_D | 89 | W |
| Single pulse avalanche energy (note2) | E_{AS} | 361 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 To 150 | $^\circ\text{C}$ |

Thermal Resistance

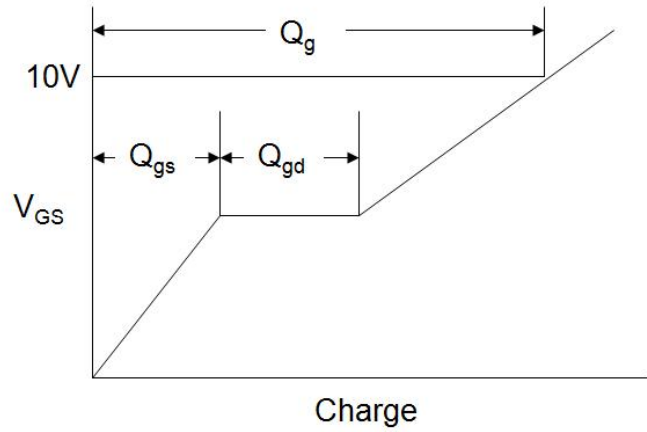
| Parameter | Symbol | Value | Unit |
|-----------------------------------------|------------|-------|--------------------|
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 55 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case | R_{thJC} | 1.4 | $^\circ\text{C/W}$ |

| Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted | | | | | | |
|------------------------------------------------------------------|---------------|------------------------------------------------------|-------|------|----------|------------|
| Parameter | Symbol | Test Conditions | Value | | | Unit |
| | | | Min. | Typ. | Max. | |
| Static Parameters | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 30V, V_{GS} = 0V$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{GS} = \pm 18V$ | -- | -- | ± 50 | μA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.7 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 10A$ | -- | 1.28 | 1.6 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 10A$ | -- | 1.66 | 2.0 | |
| Forward Transconductance | g_{FS} | $V_{GS} = 5V, I_D = 10A$ | -- | 36 | -- | S |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V,$ $V_{DS} = 15V,$ $f = 1.0MHz$ | -- | 6140 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 2171 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 552 | -- | |
| Total Gate Charge | Q_g | $V_{DD} = 15V,$ $I_D = 30A,$ $V_{GS} = 10V$ | -- | 98 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 16 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 11 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 15V,$ $I_D = 30A,$ $R_G = 1.6\Omega$ | -- | 13 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 7.5 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 51 | -- | |
| Turn-off Fall Time | t_f | | -- | 8.6 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^\circ\text{C}$ | -- | -- | 209 | A |
| Body Diode Voltage | V_{SD} | $T_J = 25^\circ\text{C}, I_{SD} = 30A, V_{GS} = 0V$ | -- | -- | 1.2 | V |
| Reverse Recovery Charge | Q_{rr} | $I_F = 30A, V_{GS} = 0V$ $di/dt=100A/us$ | -- | 112 | -- | nC |
| Reverse Recovery Time | T_{rr} | | -- | 32 | -- | ns |

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$
3. Identical low side and high side switch with identical R_G

Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

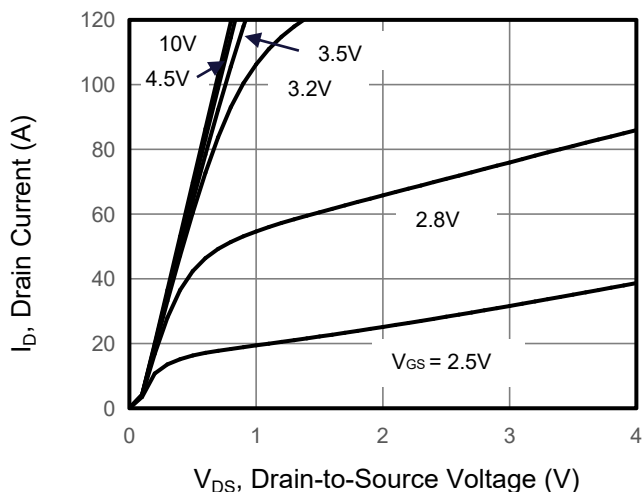


Figure 2. Transfer Characteristics

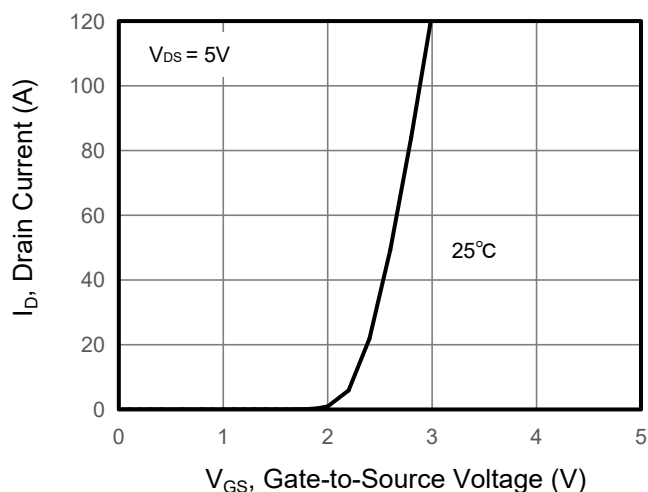


Figure 3. Drain Source On Resistance

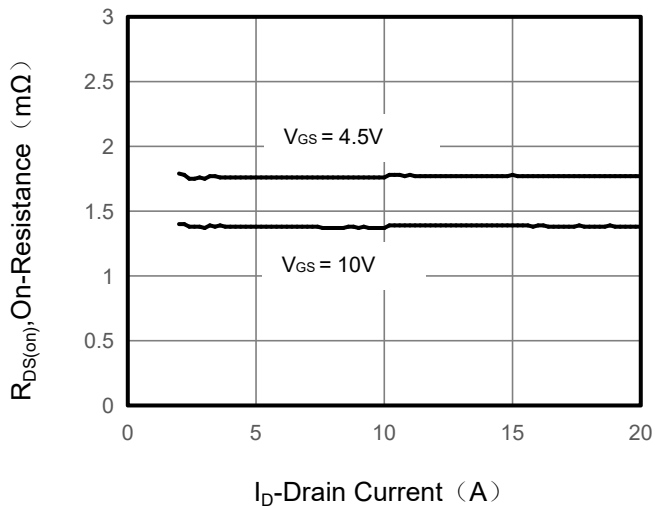


Figure 4. Gate Charge

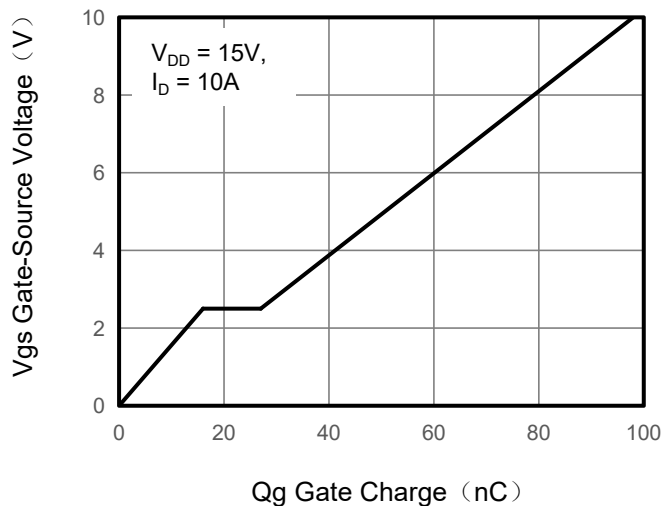


Figure 5. Capacitance

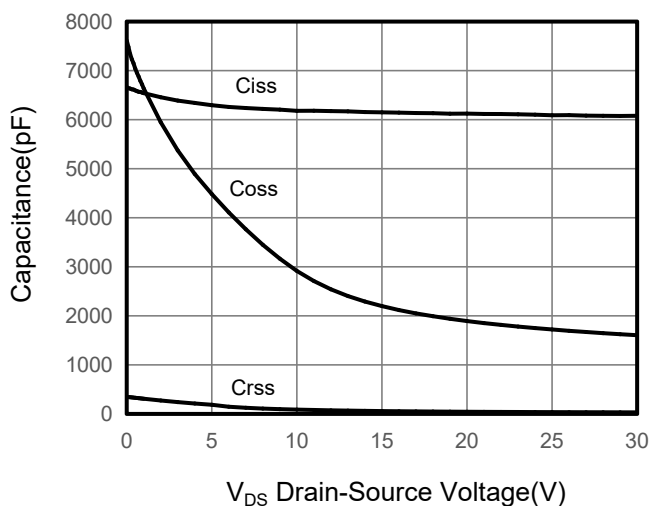
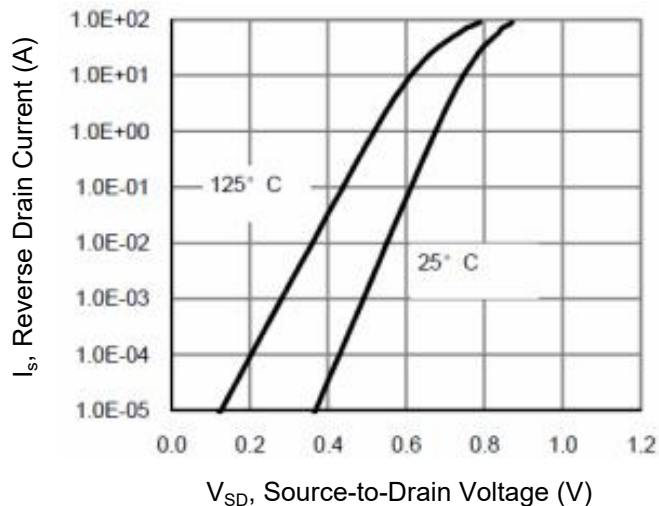


Figure 6. Source-Drain Diode Forward



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Drain-Source On-Resistance

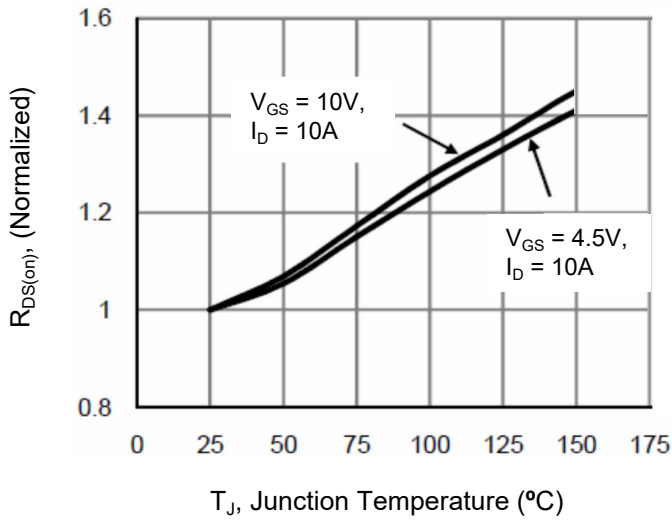


Figure 8. Safe Operation Area

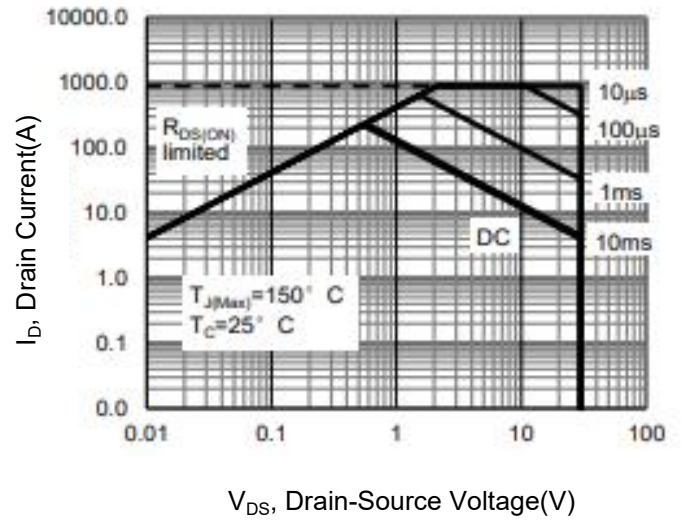
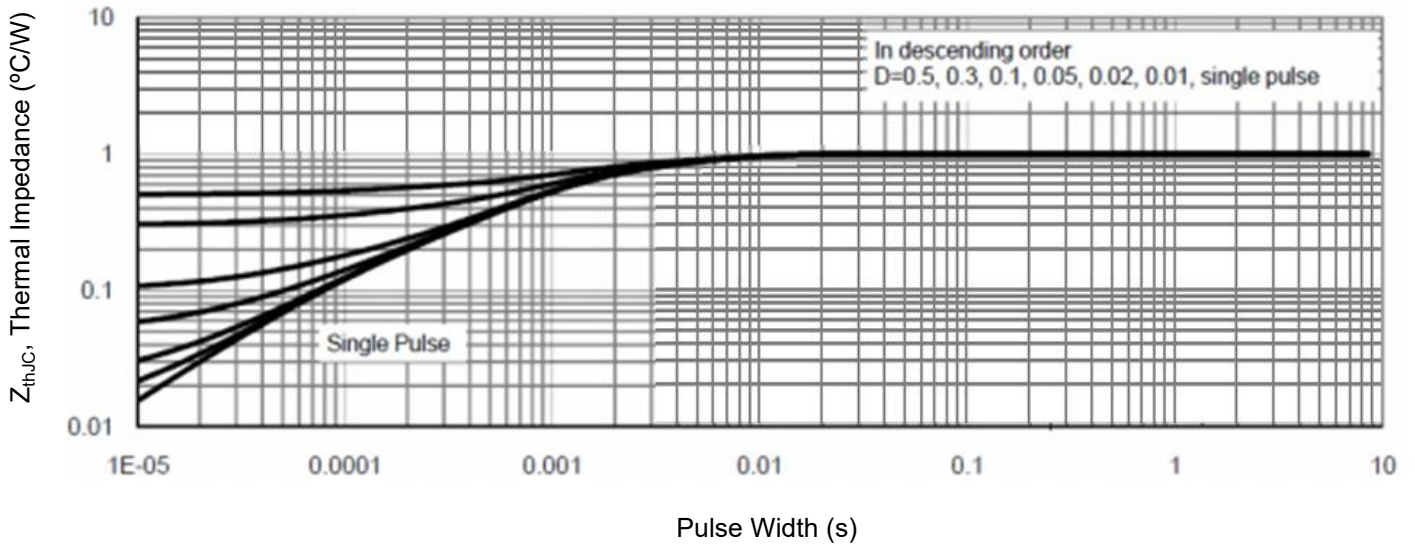
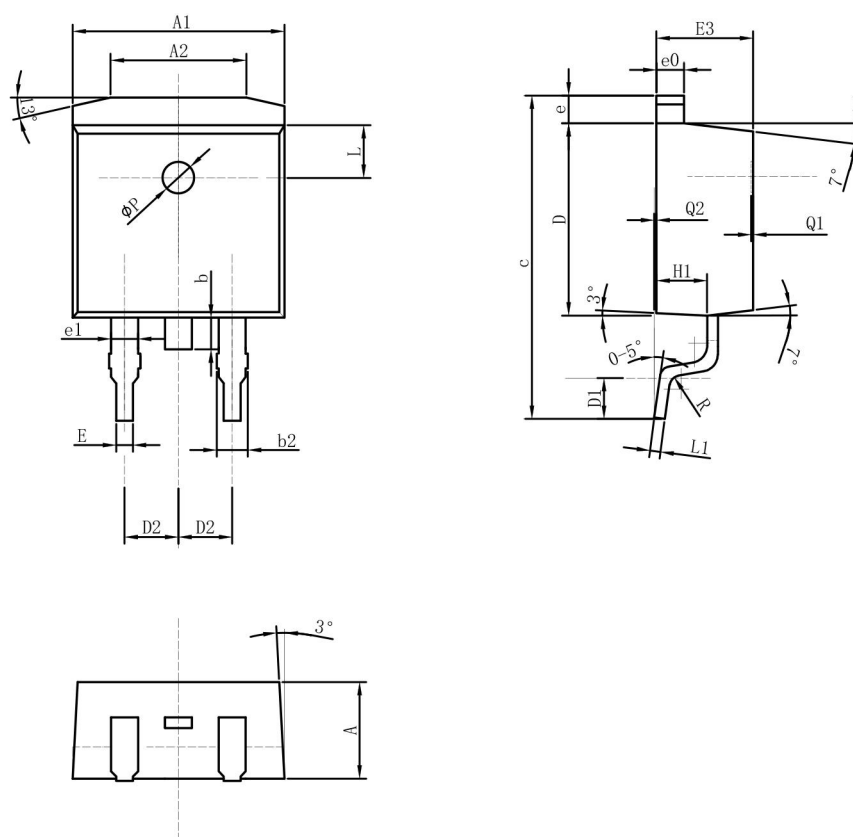


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-263 Package Information



COMMON DIMENSIONS

| SYMBOL | mm | | |
|----------|-------|-------|-------|
| | MIN | NOM | MAX |
| A | 4.52 | 4.57 | 4.62 |
| A1 | 9.95 | 10.00 | 10.05 |
| A2 | 6.30 | 6.40 | 6.50 |
| b | 1.30 | 1.50 | 1.70 |
| b2 | 1.17 | 1.27 | 1.37 |
| c | 14.80 | 15.00 | 15.20 |
| D | 9.05 | 9.10 | 9.15 |
| D1 | 1.90 | 2.10 | 2.30 |
| D2 | - | 2.54 | - |
| E | - | 0.80 | - |
| E3 | - | 4.57 | - |
| e | - | 1.30 | - |
| e0 | - | 1.30 | - |
| e1 | 1.73 | 3 | - |
| H1 | - | 2.40 | - |
| L | - | 2.50 | - |
| L1 | - | 0.50 | - |
| ϕP | - | 1.50 | - |
| R | - | 0.50 | - |
| Q1 | 0.10 | - | 0.15 |
| Q2 | 0 | - | 0.02 |

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