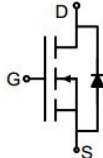
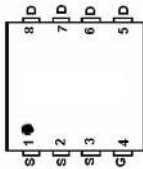



N-Channel Enhancement Mode Power MOSFET

| | |
|---|---|
| <p>Description</p> <p>The GT100N04D3 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.</p> <p>General Features</p> <ul style="list-style-type: none"> ● V_{DS} 40V ● I_D (at $V_{GS} = 10V$) 13A ● $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 10mΩ ● $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 16mΩ ● 100% Avalanche Tested ● RoHS Compliant <p>Application</p> <ul style="list-style-type: none"> ● Power switch ● DC/DC converters |  <p>Schematic diagram</p>  <p>pin assignment</p>  <p>DFN3X3-8L</p> |
|---|---|

Ordering Information

| Device | Package | Marking | Packaging |
|------------|-----------|----------|--------------|
| GT100N04D3 | DFN3X3-8L | GT100N04 | 5000psc/Reel |

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

| Parameter | Symbol | Value | Unit |
|--|----------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Continuous Drain Current | I_D | 13 | A |
| Pulsed Drain Current (note1) | I_{DM} | 52 | A |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Power Dissipation | P_D | 23 | W |
| Single pulse avalanche energy (note2) | E_{AS} | 14 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 To 150 | $^\circ\text{C}$ |

Thermal Resistance

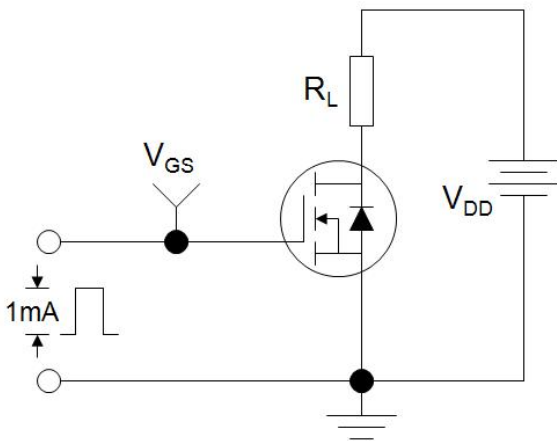
| Parameter | Symbol | Value | Unit |
|---|------------|-------|--------------------|
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 70 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case | R_{thJC} | 5.3 | $^\circ\text{C/W}$ |

| 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 | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 40 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 40V, V_{GS} = 0V$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{GS} = \pm 20V$ | -- | -- | ± 100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1 | 1.7 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 5A$ | -- | 7 | 10 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 5A$ | -- | 11 | 16 | |
| Forward Transconductance | g_{FS} | $V_{GS} = 5V, I_D = 5A$ | -- | 22 | -- | S |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V,$ $V_{DS} = 20V,$ $f = 1.0MHz$ | -- | 642 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 117 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 115 | -- | |
| Total Gate Charge | Q_g | $V_{DD} = 20V,$ $I_D = 20A,$ $V_{GS} = 10V$ | -- | 32 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 7 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 3 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 20V,$ $I_D = 20A,$ $R_G = 1.6\Omega$ | -- | 6.5 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 3 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 21 | -- | |
| Turn-off Fall Time | t_f | | -- | 3 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^\circ\text{C}$ | -- | -- | 13 | A |
| Body Diode Voltage | V_{SD} | $T_J = 25^\circ\text{C}, I_{SD} = 5, V_{GS} = 0V$ | -- | -- | 1.2 | V |
| Reverse Recovery Charge | Q_{rr} | $I_F = 20A, V_{GS} = 0V$ $di/dt=100A/us$ | -- | 16 | -- | nC |
| Reverse Recovery Time | T_{rr} | | -- | 28 | -- | ns |

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}= 40V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$
3. Identical low side and high side switch with identical R_G

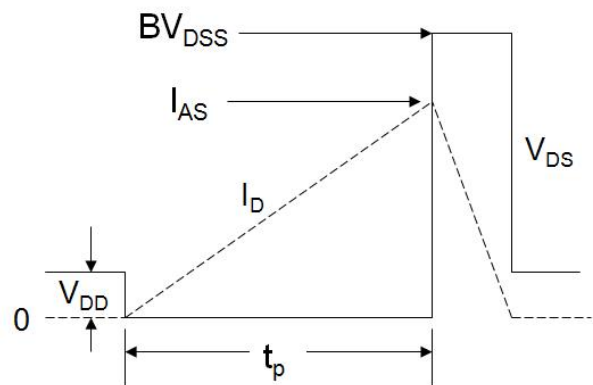
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

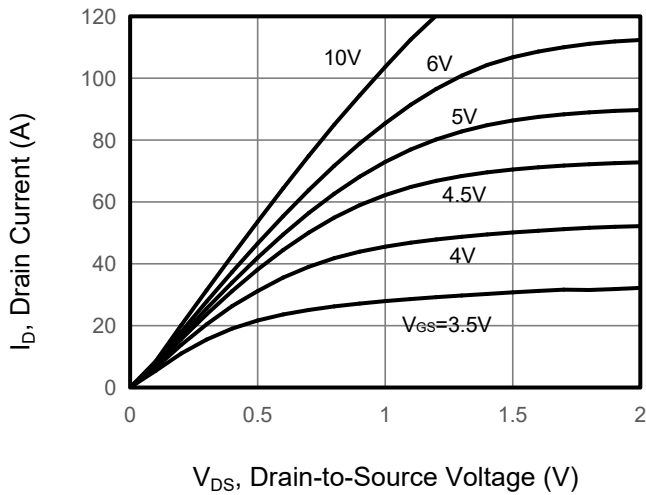


Figure 2. Transfer Characteristics

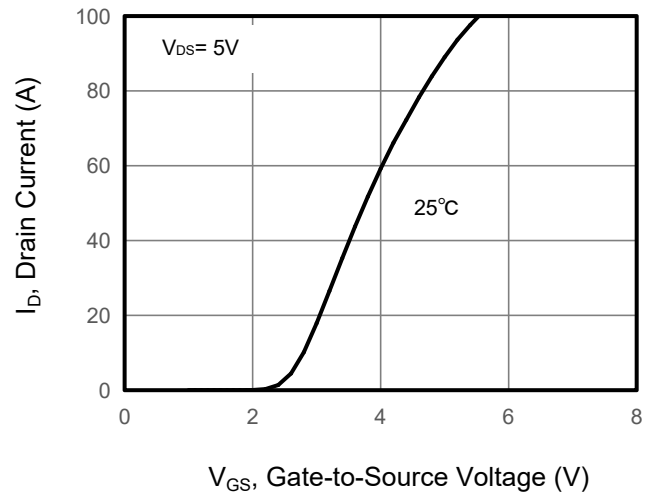


Figure 3. Drain Source On Resistance

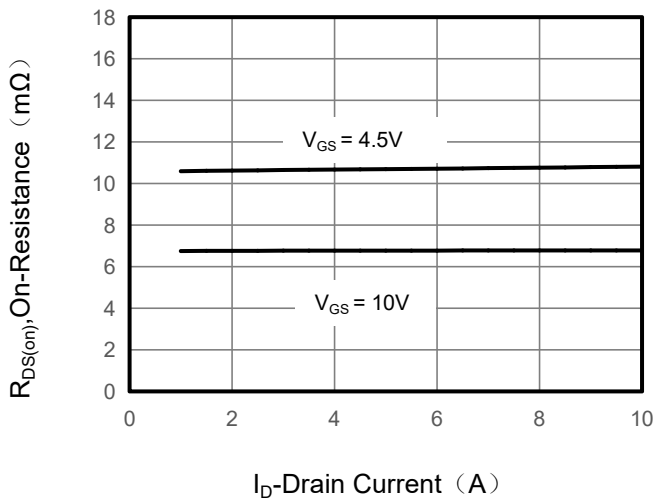


Figure 4. Gate Charge

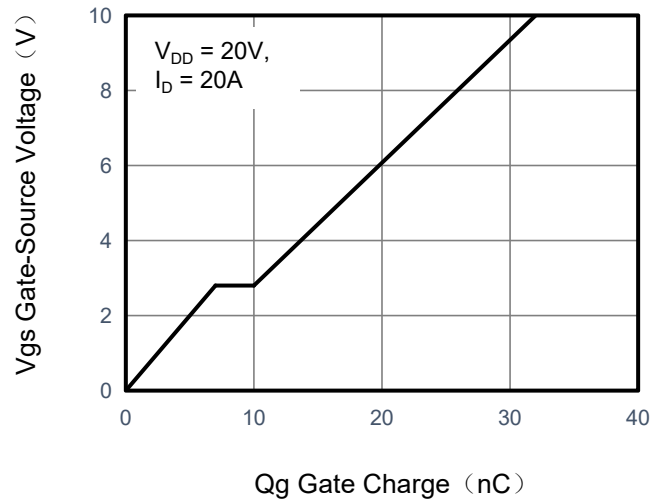


Figure 5. Capacitance

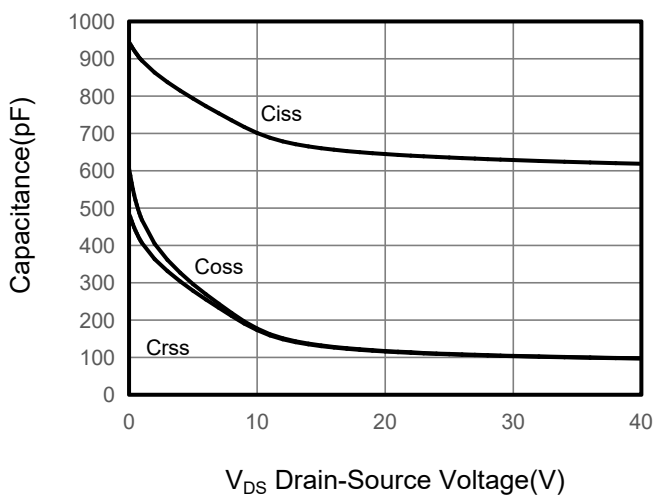
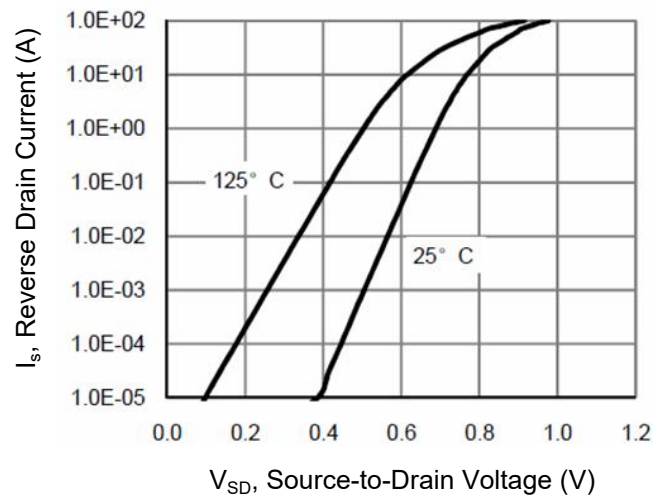


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

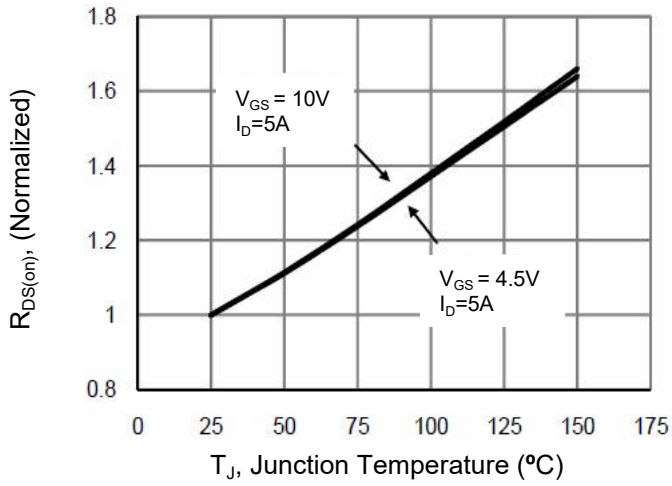


Figure 8. Safe Operation Area

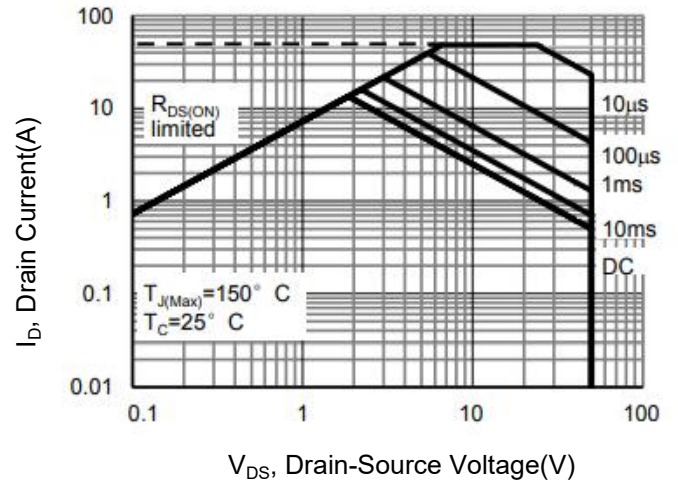
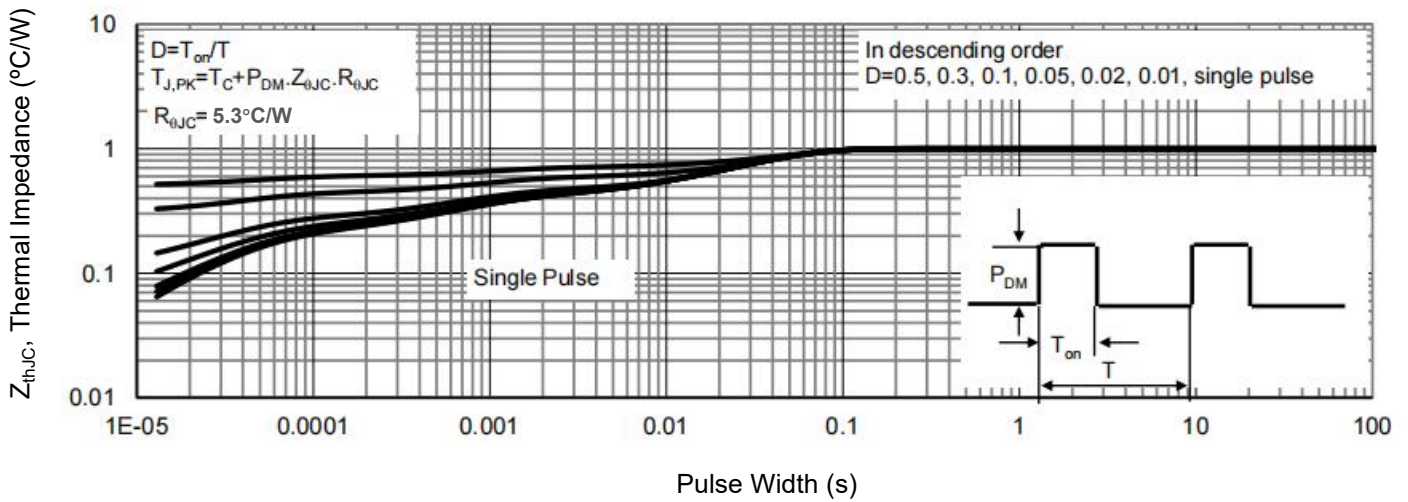
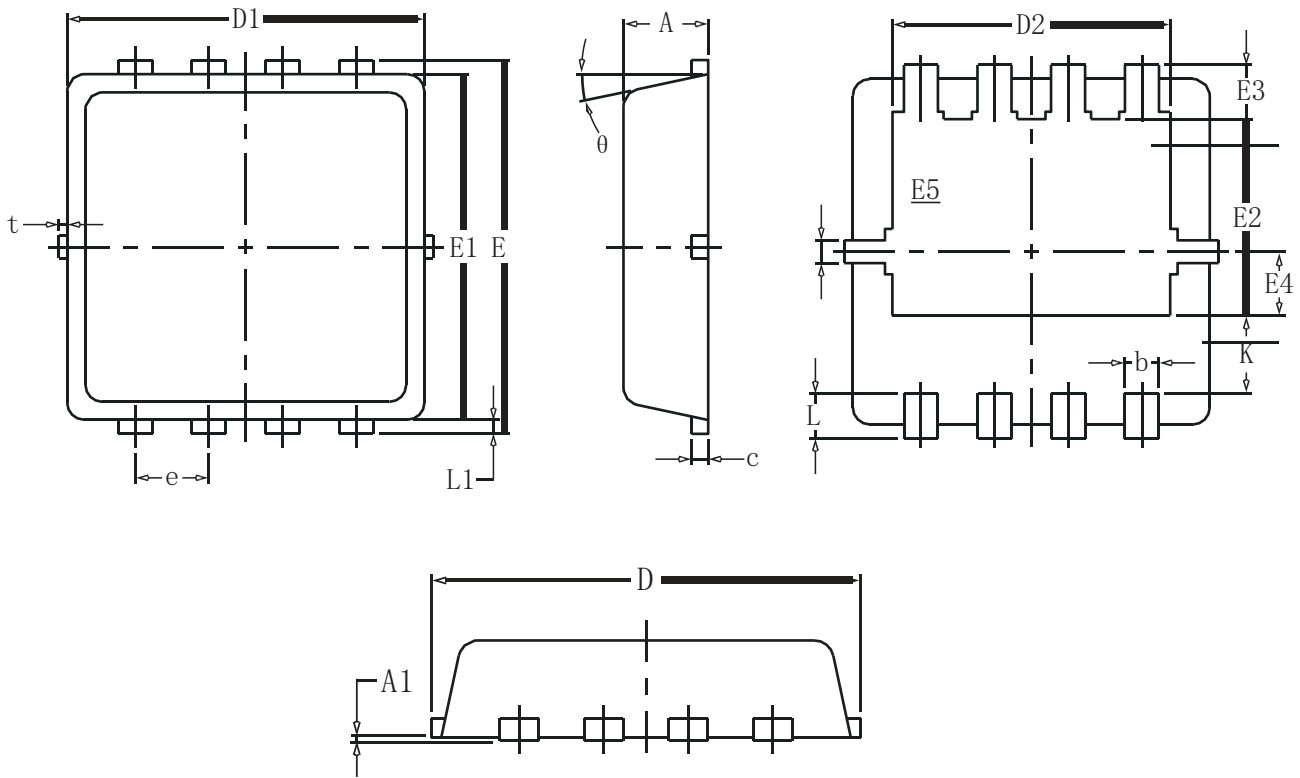


Figure 9. Normalized Maximum Transient Thermal Impedance



DFN3x3-8L Package Information



| SYMBOL | COMMON | | |
|----------|--------|-------|------|
| | MM | | |
| | MIN | NOM | MAX |
| A | 0.70 | 0.75 | 0.85 |
| A1 | - | - | 0.05 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.10 | 0.152 | 0.25 |
| D | 3.15 | 3.30 | 3.45 |
| D1 | 3.00 | 3.15 | 3.25 |
| D2 | 2.29 | 2.45 | 2.65 |
| E | 3.15 | 3.30 | 3.45 |
| E1 | 2.90 | 3.05 | 3.20 |
| E2 | 1.54 | 1.74 | 1.94 |
| E3 | 0.28 | 0.48 | 0.65 |
| E4 | 0.37 | 0.57 | 0.77 |
| E5 | 0.10 | 0.20 | 0.30 |
| e | 0.60 | 0.65 | 0.70 |
| K | 0.59 | 0.69 | 0.89 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.06 | 0.125 | 0.20 |
| t | 0 | 0.075 | 0.13 |
| θ | 10° | 12° | 14° |