

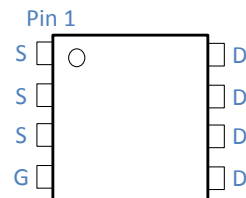
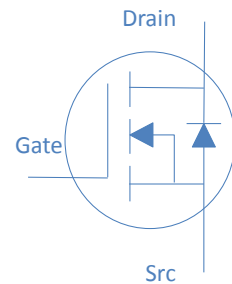
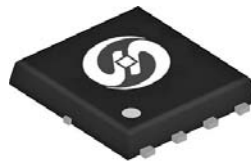
30V N-Ch Power MOSFET
Feature

- ◇ High Speed Power Switching, Logic Level
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

| | | | |
|-------------------------|--------------|-----|-----------|
| V_{DS} | | 30 | V |
| $R_{DS(on),typ}$ | $V_{GS}=10V$ | 2.5 | $m\Omega$ |
| I_D (Silicon Limited) | | 75 | A |

Application

- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Industrial

DFN5x6


| Part Number | Package | Marking |
|-------------|---------|----------|
| HTN030N03 | DFN5x6 | TN030N03 |

Absolute Maximum Ratings at $T_j=25^\circ\text{C}$ (unless otherwise specified)

| Parameter | Symbol | Conditions | Value | Unit |
|--|----------------|--|------------|------------------|
| Continuous Drain Current (Silicon Limited) | I_D | $T_C=25^\circ\text{C}$ | 75 | A |
| | | $T_C=100^\circ\text{C}$ | 45 | |
| Drain to Source Voltage | V_{DS} | - | 30 | V |
| Gate to Source Voltage | V_{GS} | - | ± 20 | V |
| Pulsed Drain Current | I_{DM} | - | 160 | A |
| Avalanche Energy, Single Pulse | E_{AS} | $L=0.1\text{mH}, T_C=25^\circ\text{C}$ | 168 | mJ |
| Power Dissipation | P_D | $T_C=25^\circ\text{C}$ | 50 | W |
| Operating and Storage Temperature | T_J, T_{stg} | - | -55 to 150 | $^\circ\text{C}$ |

Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|-------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 50 | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 2.5 | $^\circ\text{C/W}$ |

Electrical Characteristics at $T_J=25^{\circ}\text{C}$ (unless otherwise specified)
Static Characteristics

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------------------------------|---------------|--|-------|-----|-----------|------------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 30 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$ | 1 | 1.5 | 3 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{GS}=0V, V_{DS}=24V, T_J=25^{\circ}\text{C}$ | - | - | 1 | μA |
| | | $V_{GS}=0V, V_{DS}=20V, T_J=125^{\circ}\text{C}$ | - | - | 25 | |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Drain to Source on Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=30A$ | - | 2.5 | 3 | m Ω |
| | | $V_{GS}=4.5V, I_D=24A$ | - | 3 | 4 | |
| Transconductance | g_{fs} | $V_{DS}=5V, I_D=24A$ | - | 25 | - | S |
| Gate Resistance | R_G | $V_{GS}=15mV, V_{DS}=0V, f=1MHz$ | - | 1.6 | - | Ω |

Dynamic Characteristics

| | | | | | | |
|-------------------------------|--------------|--|---|------|---|----|
| Input Capacitance | C_{iss} | $V_{GS}=0V, V_{DS}=15V, f=1MHz$ | - | 2979 | - | pF |
| Output Capacitance | C_{oss} | | - | 381 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 224 | - | |
| Total Gate Charge | $Q_g(10V)$ | $V_{DD}=15V, I_D=30A, V_{GS}=10V$ | - | 44.6 | - | nC |
| | $Q_g(4.5V)$ | | - | 21.2 | - | |
| Gate to Source Charge | Q_{gs} | | - | 8.3 | - | |
| Gate to Drain (Miller) Charge | Q_{gd} | | - | 6.5 | - | |
| Turn on Delay Time | $t_{d(on)}$ | $V_{DD}=15V, I_D=24A, V_{GS}=10V,$ $R_G=2.7\Omega,$ | - | 15 | - | ns |
| Rise time | t_r | | - | 10 | - | |
| Turn off Delay Time | $t_{d(off)}$ | | - | 50 | - | |
| Fall Time | t_f | | - | 10 | - | |

Reverse Diode Characteristics

| | | | | | | |
|-------------------------|----------|-------------------------------|---|----|-----|----|
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_F=75A$ | - | | 1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F=75A, di_F/dt=100A/\mu s$ | - | 32 | - | ns |
| Reverse Recovery Charge | Q_{rr} | | - | 12 | - | nC |

Fig 1. Typical Output Characteristics

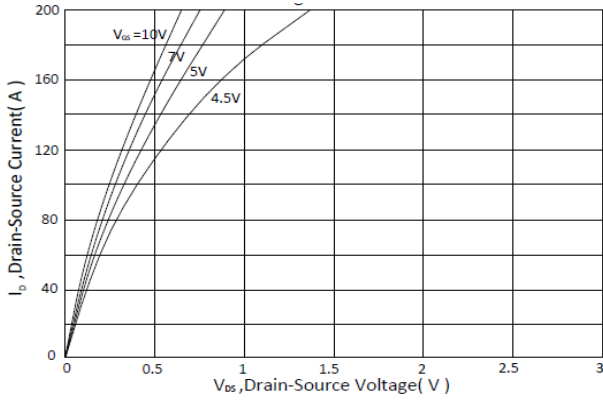


Figure 2. On-Resistance vs. Gate-Source Voltage

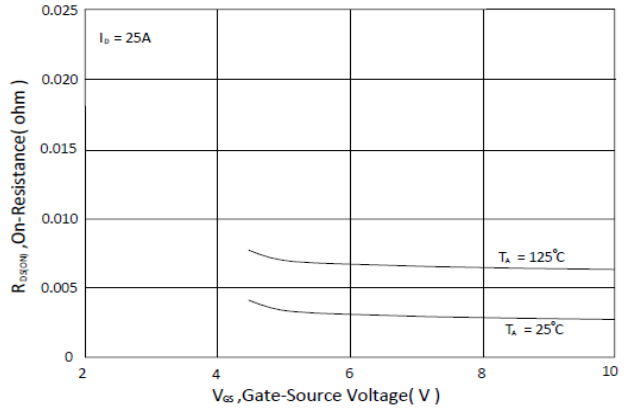


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

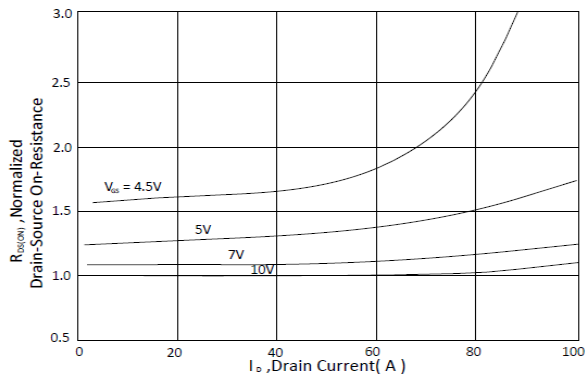


Figure 4. Normalized On-Resistance vs. Junction Temperature

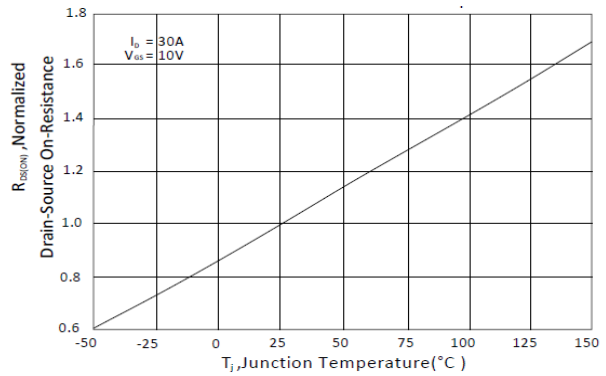


Figure 5. Typical Transfer Characteristics

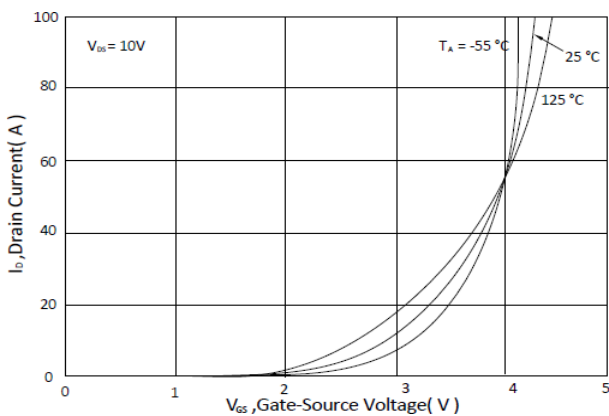


Figure 6. Typical Source-Drain Diode Forward Voltage

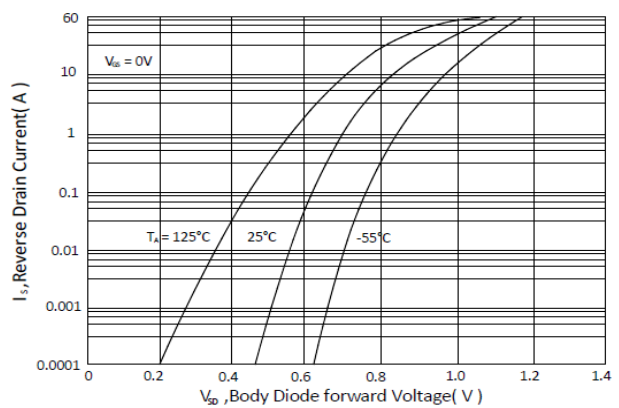


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

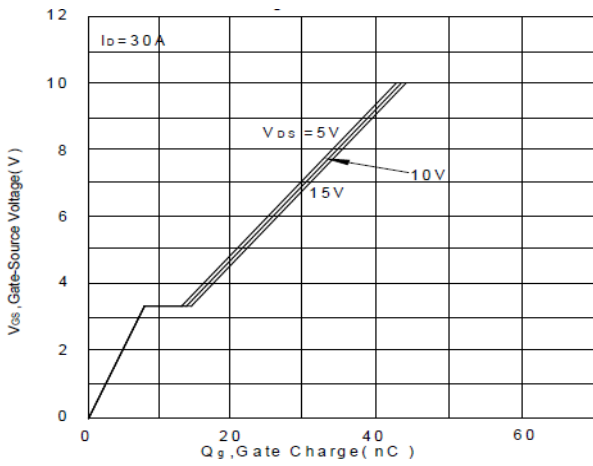


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

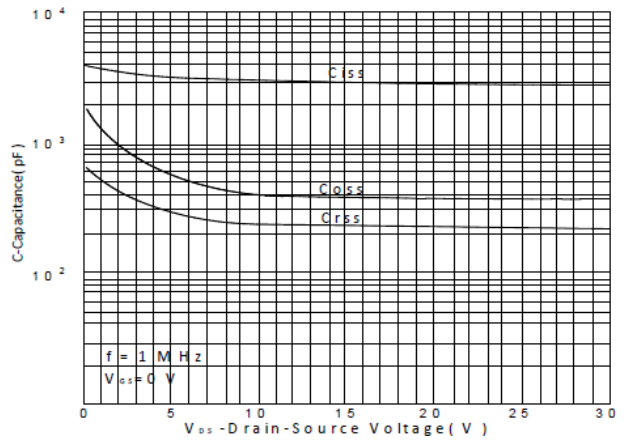


Figure 9. Maximum Safe Operating Area

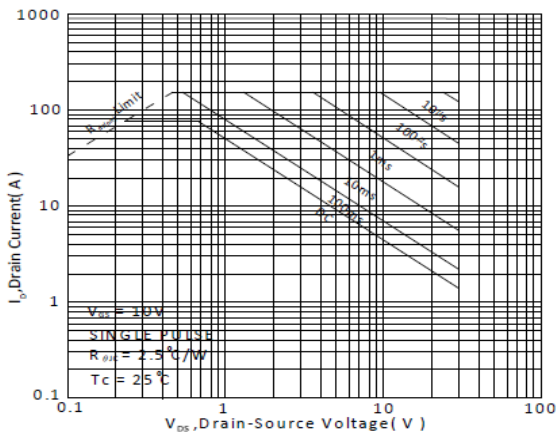


Figure 10. Maximum Drain Current vs. Case Temperature

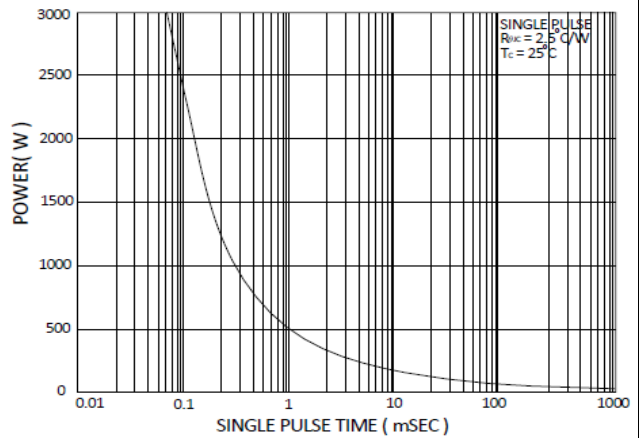
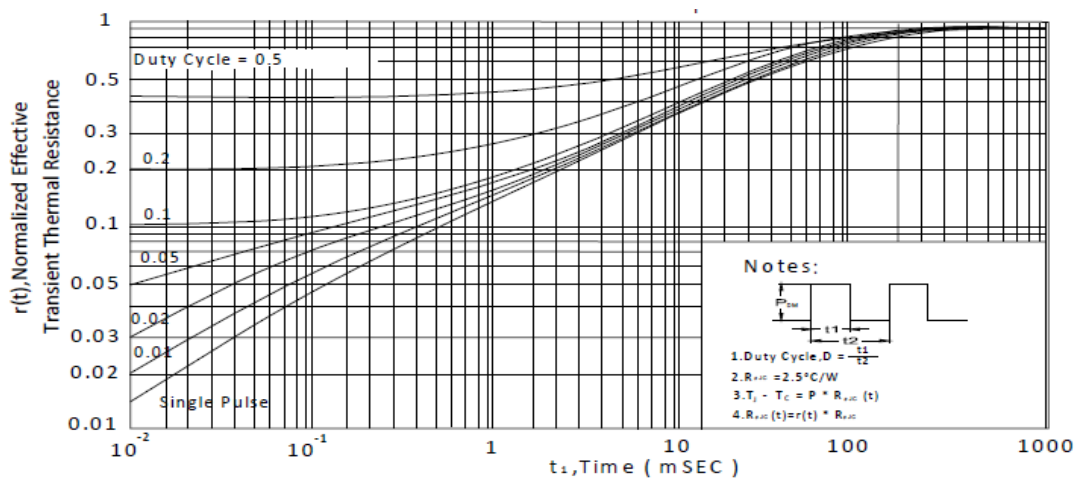
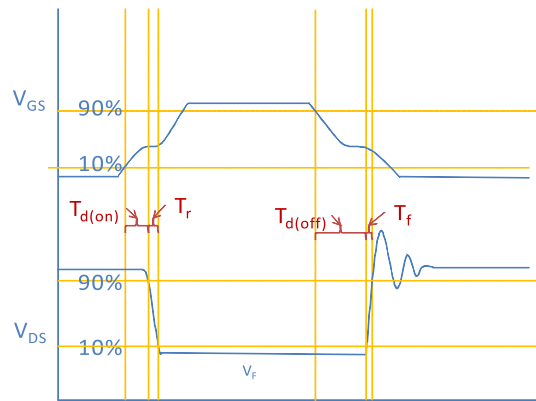


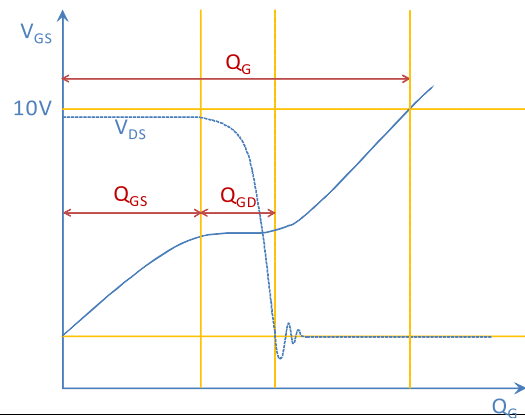
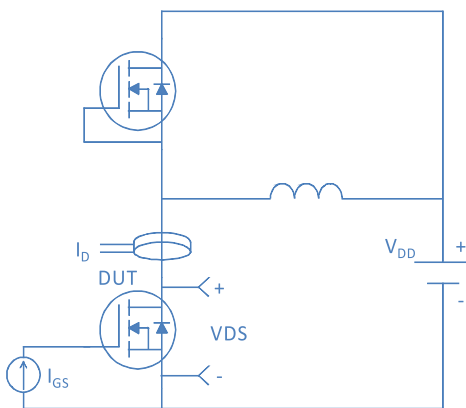
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



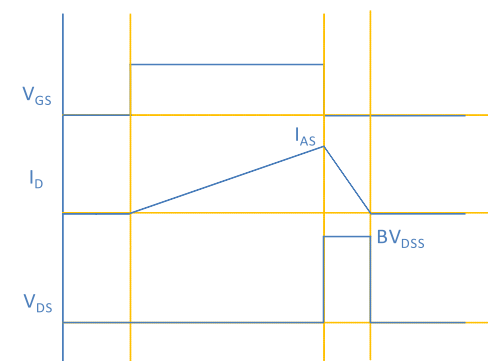
Inductive switching Test



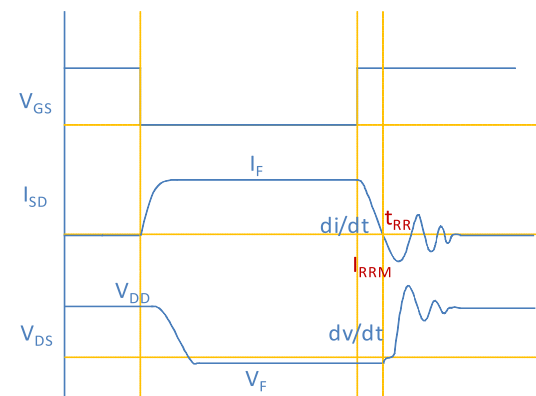
Gate Charge Test



Uclamped Inductive Switching (UIS) Test

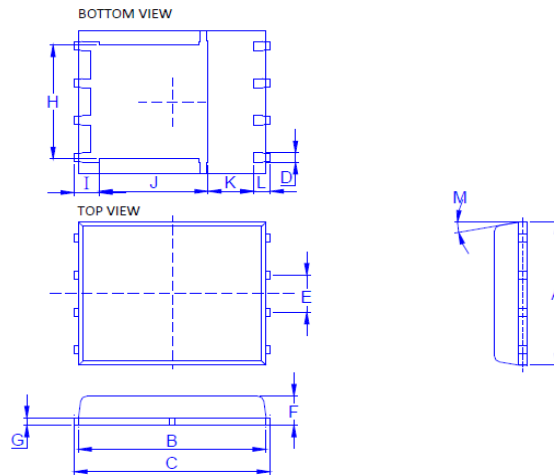


Diode Recovery Test



Package Outline

DFN5*6, 8leads



Dimension in mm

| Dimension | A | B | C | D | E | F | G | H | I | J | K | L | M |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Min. | 4.80 | 5.50 | 5.90 | 0.3 | | 0.85 | 0.15 | 3.67 | 0.41 | 3.00 | 0.94 | 0.45 | 0° |
| Typ. | | | | | 1.27 | | | | | | | | |
| Max. | 5.30 | 5.90 | 6.15 | 0.51 | | 1.20 | 0.30 | 4.54 | 0.85 | 3.92 | 1.7 | 0.71 | 12° |