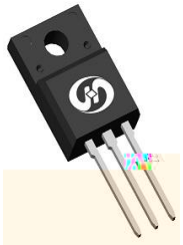
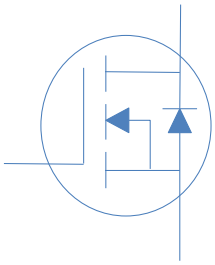
# 100V N-Ch Power MOSFET

| | | | |
|---|---|---|---|
| $V_{DS}$ | | 100 | V |
| $R_{DS(on),typ}$ | $V_{GS}$=10V | 9.3 | m |
| $I_{D\ (Sillicon\ Limited)}$ | | 37 | A |





| Part Number | Package | Marking |
|---|---|---|
| HGA098N10A | TO-220F | GA098N10A |

## Absolute Maximum Ratings at $T_j$=25℃ (unless otherwise specified)

| Parameter | Symbol | Conditions | Value | Unit |
|---|---|---|---|---|
| Continuous Drain Current (Silicon Limited) | $I_D$ | $T_C$=25℃ | 37 | A |
| | | $T_C$=100℃ | 26 | |
| Drain to Source Voltage | $V_{DS}$ | - | 100 | V |
| Gate to Source Voltage | $V_{GS}$ | - | ±20 | V |
| Pulsed Drain Current | $I_{DM}$ | - | 140 | A |
| Avalanche Energy, Single Pulse | $E_{AS}$ | L=0.1mH, $T_C$=25℃ | 31 | mJ |
| Power Dissipation | $P_D$ | $T_C$=25℃ | 30 | W |
| Operating and Storage Temperature | $T_J$, $T_{stg}$ | - | -55 to175 | ℃ |

## Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance Junction-Ambient | $R_{JA}$ | 60 | ℃/W |
| Thermal Resistance Junction-Case | $R_{JC}$ | 5 | ℃/W |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | $V_{GS}$=10V, $I_D$=20A | - | 9.3 | 10.5 | m |
| | | | - | | | |

**Dynamic Characteristics**

| | | | | | | |
|---|---|---|---|---|---|---|
| Input Capacitance | $C_{iss}$ | | | | - | |
| Output Capacitance | | $V_{GS}$=0V, $V_{DS}$=50V, f=1MHz | | 262 | | |
| | | | - | 7.7 | | |
| Total Gate Charge | $Q_g$(10V) | | - | 23 | - | |
| Gate to Source Charge | $Q_{gs}$ | $V_{DD}$=50V, $I_D$=20A, $V_{GS}$=10V | | | - | |
| Gate to Drain (Miller) Charge | $Q_{gd}$ | | - | 6.5 | - | |
| Turn on Delay Time | $t_{d(on)}$ | | - | 6 | - | |
| Rise time | $t_r$ | $V_{DD}$=50V, $I_D$=20A, $V_{GS}$=10V, | - | 3 | - | ns |
| Turn off Delay Time | $t_{d(off)}$ | $R_G$=10 , | - | 17 | - | |
| Fall Time | $t_f$ | | - | 4 | - | |

**Reverse Diode Characteristics**

| | | | | | | |
|---|---|---|---|---|---|---|
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_F$=20A | - | 0.9 | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $V_R$=50V, $I_F$=20A, $dI_F/dt$=500A/ s | | | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 176 | - | nC |

Fig 1. Typical Output Characteristics

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

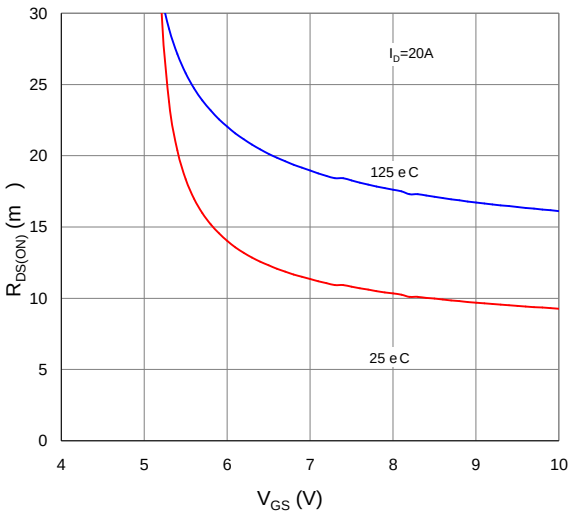



Figure 3. On-Resistance vs. Drain Current and Gate Voltage

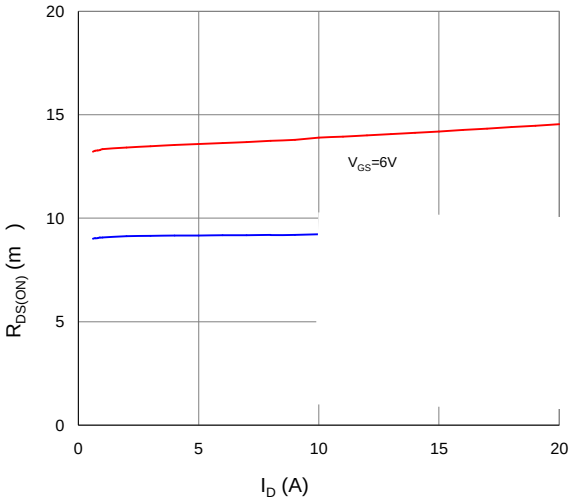



Figure 4. Normalized On-Resistance vs. Junction Temperature

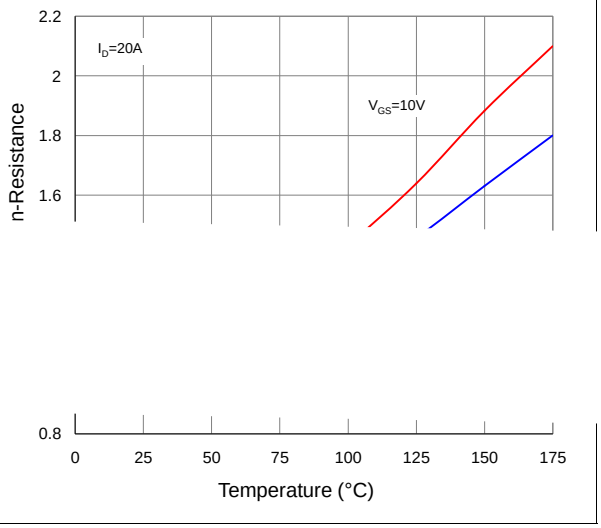



Figure 5. Typical Transfer Characteristics

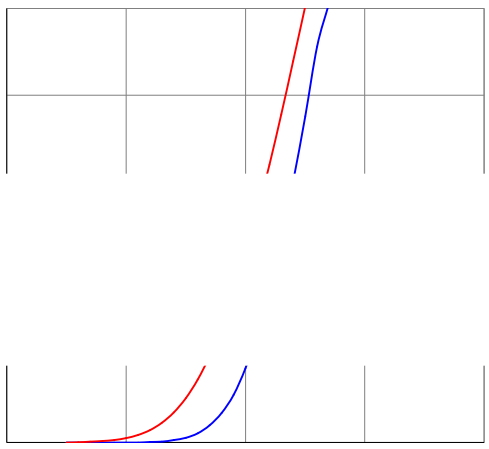


Figure 6. Typical Source-Drain Diode Forward Voltage

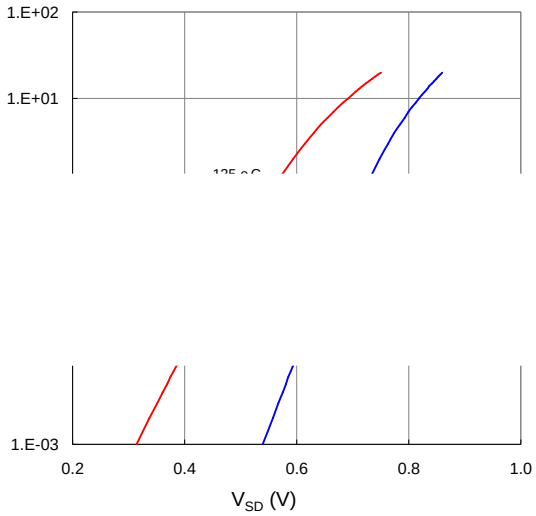


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

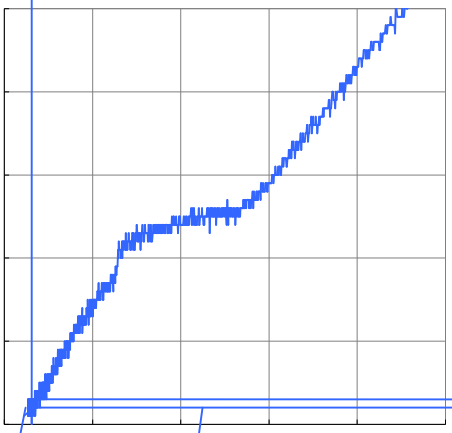


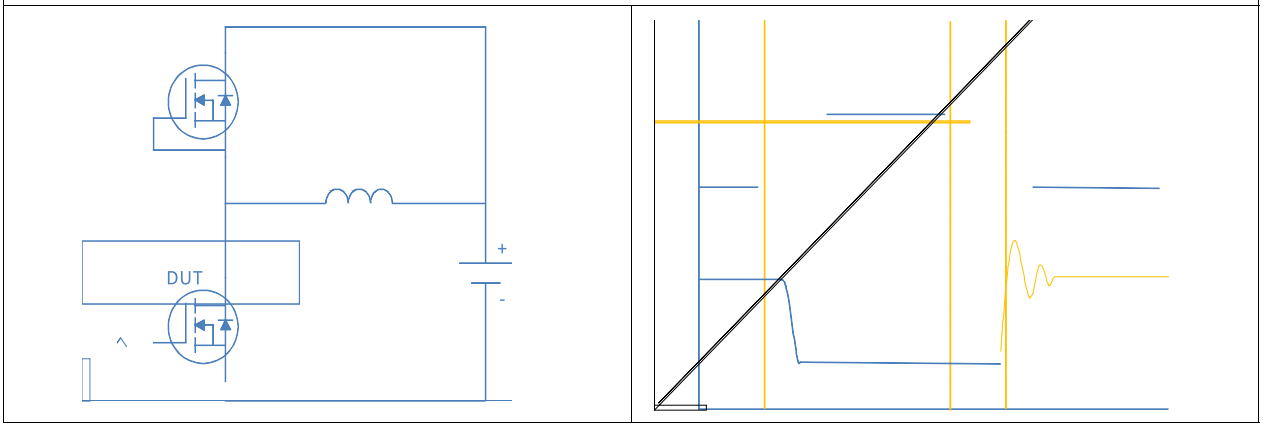
Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

Figure 9. Maximum Safe Operating Area

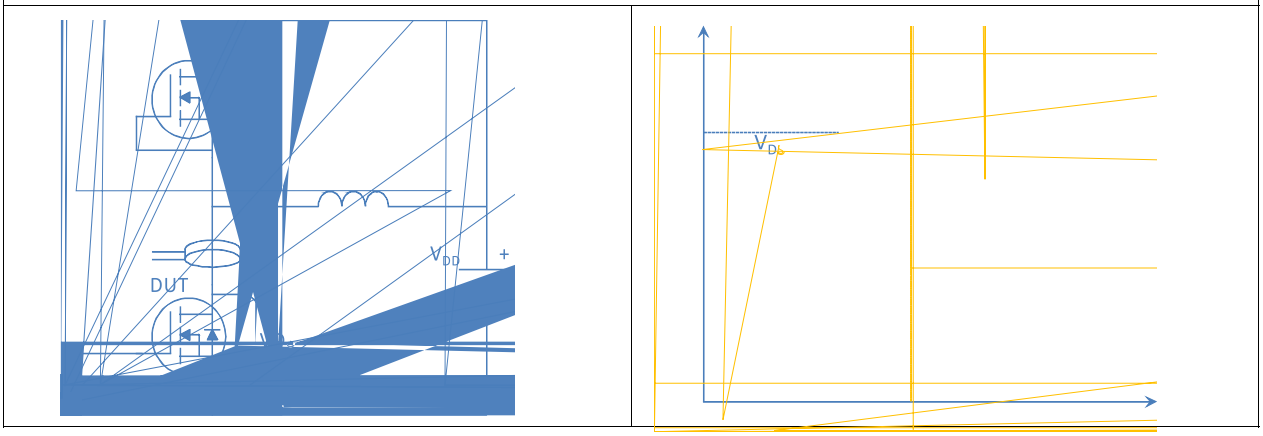
Figure 10. Maximun Drain Current vs. Case Temperature

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

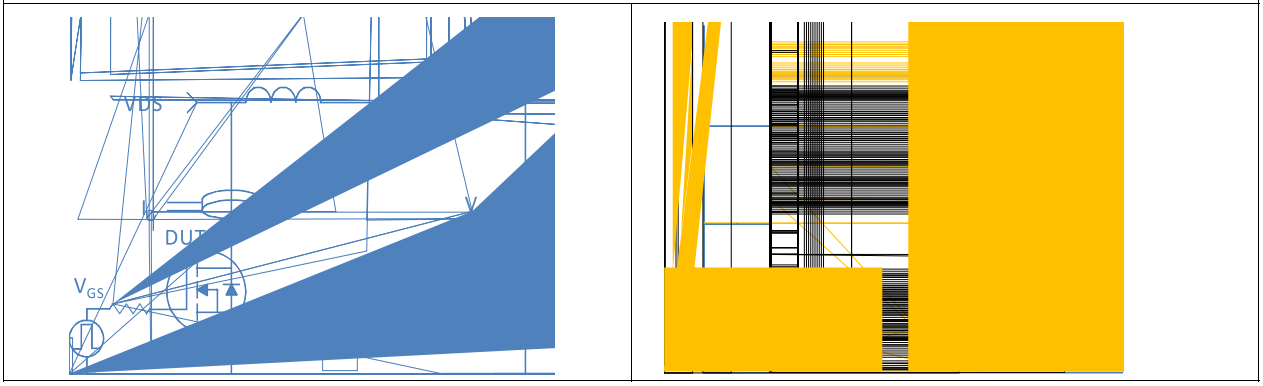
## Inductive switching Test



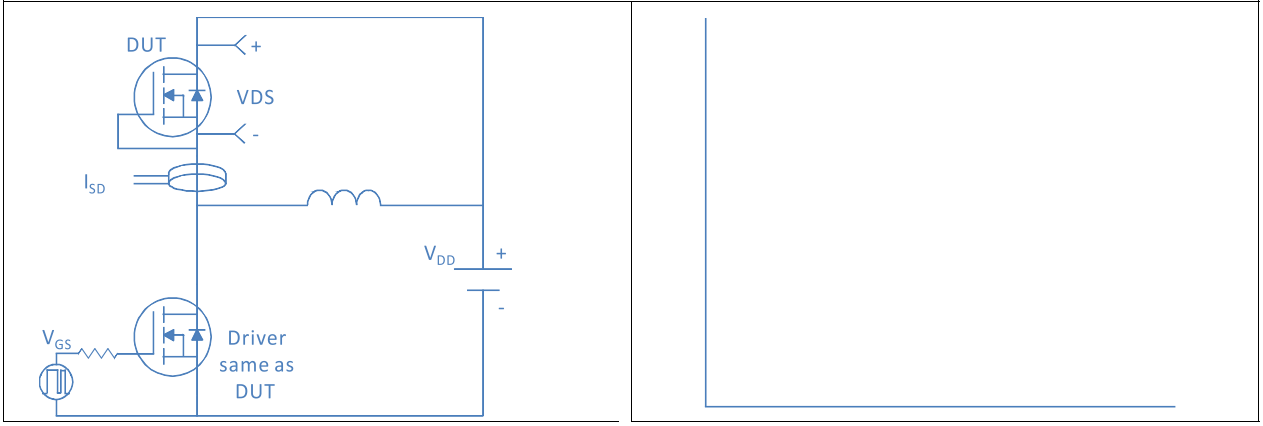

## Gate Charge Test




## Uclamped Inductive Switching (UIS) Test

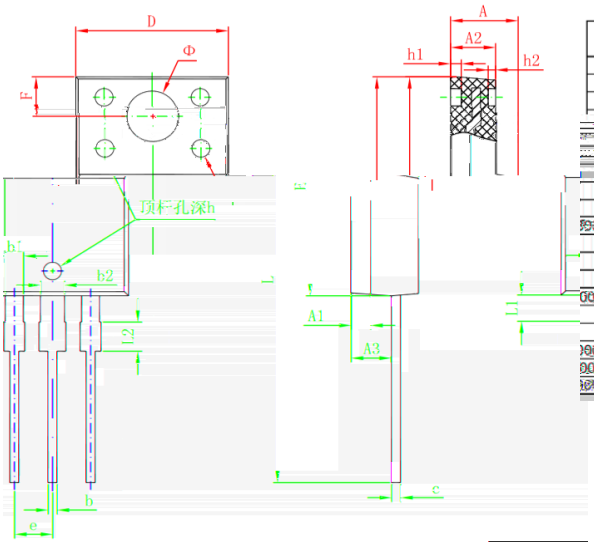



## Diode Recovery Test



Package Outline

**TO-220F, 3 leads**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 4.300 | 4.700 | 0.169 | 0.185 |
| A1 | 1.300 REF. | | 0.051 REF. | |
| A2 | 2.800 | 3.200 | 0.110 | 0.126 |
| b | 0.600 | 0.900 | 0.024 | 0.035 |
| b1 | 1.200 | 1.500 | 0.047 | 0.059 |
| b2 | 1.200 | 1.500 | 0.047 | 0.059 |
| c | 0.500 | 0.750 | 0.020 | 0.030 |
| D | 9.960 | 10.360 | 0.392 | 0.408 |
| e | 2.540 TYP | | 0.100 TYP | |
| e1 | 5.080 TYP | | 0.200 TYP | |
| E | 9.960 | 10.360 | 0.392 | 0.408 |
| E1 | 6.600 REF. | | 0.260 REF. | |
| E2 | 2.700 REF. | | 0.106 REF. | |
| F | 3.500 REF. | | 0.138 REF. | |
| h | 0.300 | 0.800 | 0.012 | 0.031 |
| h1 | 0.800 REF. | | 0.031 REF. | |
| h2 | 0.500 REF. | | 0.020 REF. | |
| L | 28.400 | 29.000 | 1.118 | 1.142 |
| L1 | 1.900 | 2.100 | 0.075 | 0.083 |
| L2 | 2.400 | 2.800 | 0.094 | 0.110 |