# HGN052N10SL P-1

## 100V N-Ch Power MOSFET

| | | | |
|---|---|---|---|
| $V_{DS}$ | | 100 | V |
| $R_{DS(on),typ}$ | $V_{GS}$=10V | 4.6 | mΩ |
| $R_{DS(on),typ}$ | $V_{GS}$=4.5V | 5.6 | mΩ |
| $I_{D\ (Sillicon\ Limited)}$ | | 115 | A |
| $I_{D\ (Package\ Limited)}$ | | 60 | A |

### Feature

Optimized for high speed smooth switching,Logic level

Enhanced Body diode dv/dt capability

Enhanced Avalanche Ruggedness

100% UIS Tested, 100% Rg Tested

### Application

DC-DC Conversion

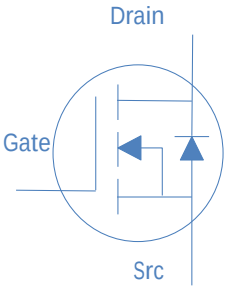
Hard Switching and High Speed Circuit

Power Tools

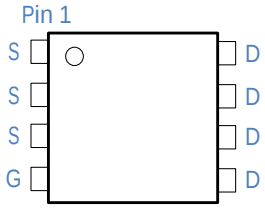
UPS

SSR

DFN5x6




| Part Number | Package | Marking |
|---|---|---|
| HGN052N10SL | DFN5x6 | GN052N10SL |




### 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 | 115 | A |
| | | $T_C$=100 | 73 | |
| Continuous Drain Current (Package Limited) | | $T_C$=25 | 60 | |
| Drain to Source Voltage | $V_{DS}$ | - | 100 | V |
| Gate to Source Voltage | $V_{GS}$ | - | ±20 | V |
| Pulsed Drain Current | $I_{DM}$ | - | 300 | A |
| Avalanche Energy, Single Pulse | $E_{AS}$ | L=0.3mH, $T_C$=25 | 240 | mJ |
| Power Dissipation | $P_D$ | $T_C$=25 | 125 | W |
| Operating and Storage Temperature | $T_J$, $T_{stg}$ | - | -55 to150 | |

### Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 1 | /W |
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 50 | /W |

## Electrical Characteristics at $T_j$=25 (unless otherwise specified)

### Static Characteristics

| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 100 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$=$V_{DS}$, $I_D$=250μA | 1.4 | 1.7 | 2.4 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{GS}$=0V, $V_{DS}$=100V, $T_j$=25 | - | - | 1 | μA |
| | | $V_{GS}$=0V, $V_{DS}$=100V, $T_j$=100 | - | - | 100 | |
| Gate to Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| Drain to Source on Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=20A | - | 4.6 | 5.2 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=20A | - | 5.6 | 7 | mΩ |
| Transconductance | $g_{fs}$ | $V_{DS}$=5V, $I_D$=20A | - | 70 | - | S |
| Gate Resistance | $R_G$ | $V_{GS}$=0V, $V_{DS}$ Open, f=1MHz | - | 3.5 | - | Ω |

### Dynamic Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=50V, f=1MHz | - | 4351 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 323 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 12 | - | |
| Total Gate Charge | $Q_g$(10V) | $V_{DD}$=50V, $I_D$=20A, $V_{GS}$=10V | - | 60 | - | nC |
| Total Gate Charge | $Q_g$(4.5V) | | - | 26 | - | |
| Gate to Source Charge | $Q_{gs}$ | | - | 8 | - | |
| Gate to Drain (Miller) Charge | $Q_{gd}$ | | - | 10 | - | |
| Turn on Delay Time | $t_{d(on)}$ | $V_{DD}$=50V, $I_D$=20A, $V_{GS}$=10V, $R_G$=10Ω, | - | 15 | - | ns |
| Rise time | $t_r$ | | - | 6 | - | |
| Turn off Delay Time | $t_{d(off)}$ | | - | 42 | - | |
| Fall Time | $t_f$ | | - | 8 | - | |

### 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/μs | - | 50 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 275 | - | nC |

Fig 1. Typical Output Characteristics

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

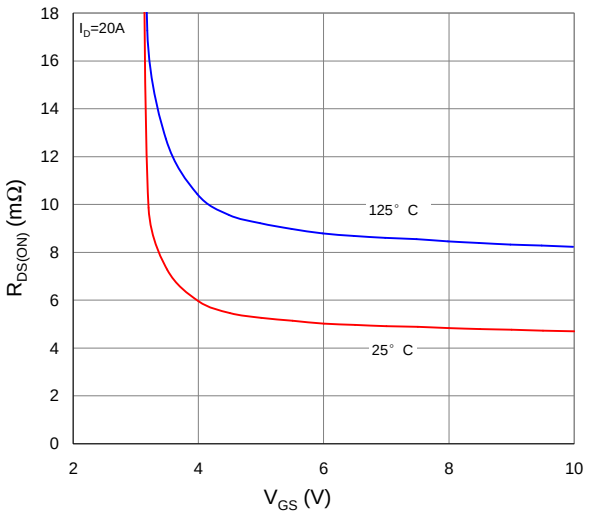



Figure 3. On-Resistance vs. Drain Current and Gate Voltage

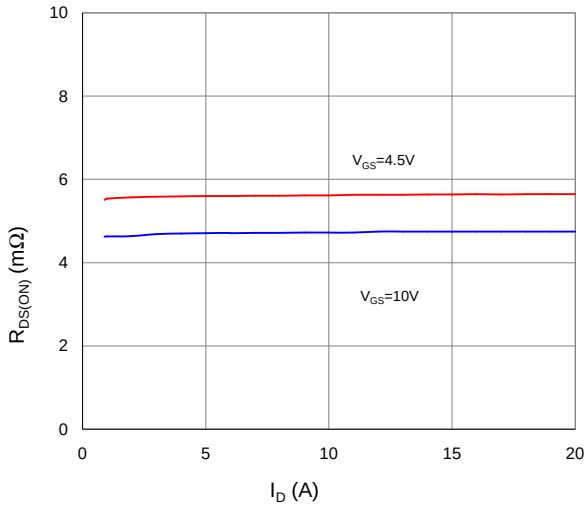



Figure 4. Normalized On-Resistance vs. Junction Temperature

Figure 5. Typical Transfer Characteristics

Figure 6. Typical Source-Drain Diode Forward Voltage

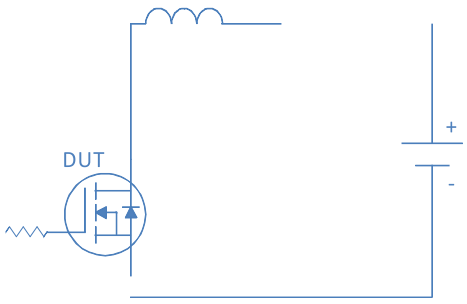
| Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage | Figure 8. Typical Capacitance vs. Drain-to-Source Voltage |
|---|---|
| | |

| Figure 9. Maximum Safe Operating Area | Figure 10. Maximun Drain Current vs. Case Temperature |
|---|---|
| | |

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

| Inductive switching Test | |
|---|---|
| | |

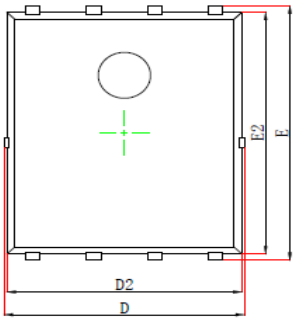
| Gate Charge Test | |
|---|---|
| | |

| Uclamped Inductive Switching (UIS) Test | |
|---|---|
|  | |

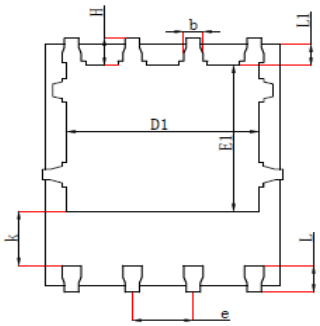
| Diode Recovery Test | |
|---|---|
| | |

Package Outline

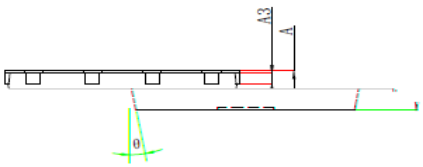
## DFN5x6_P, 8 Leads




Top View
[顶视图]




Bottom View
[背视图]




Side View
[侧视图]

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A3 | 0.254 REF | | 0.010REF | |
| D | 4.680 | 5.120 | 0.184 | 0.202 |
| E | 5.900 | 6.126 | 0.232 | 0.241 |
| D1 | 3.610 | 4.110 | 0.142 | 0.162 |
| E1 | 3.380 | 3.780 | 0.133 | 0.149 |
| D2 | 4.800 | 5.000 | 0.189 | 0.197 |
| E2 | 5.674 | 5.826 | 0.223 | 0.229 |
| k | 1.100 | 1.390 | 0.043 | 0.055 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| e | 1.270TYP | | 1.270TYP | |
| L | 0.510 | 0.711 | 0.020 | 0.028 |
| L1 | 0.424 | 0.576 | 0.017 | 0.023 |
| H | 0.410 | 0.726 | 0.016 | 0.029 |
| θ | $0^0$ | $12^0$ | $0^0$ | $12^0$ |