

60V N-Ch Power MOSFET

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|-------------------------|---------------|-----|------------|
| V_{DS} | | 60 | V |
| $R_{DS(on),typ}$ | $V_{GS}=10V$ | 2.9 | m Ω |
| $R_{DS(on),typ}$ | $V_{GS}=4.5V$ | 4.1 | m Ω |
| $R_{DS(on),typ}$ | $V_{GS}=10V$ | 3.2 | m Ω |
| $R_{DS(on),typ}$ | $V_{GS}=4.5V$ | 4.4 | m Ω |
| I_D (Silicon Limited) | | 140 | A |
| I_D (Package Limited) | | 120 | A |

| Part Number | Package | Marking |
|-------------|---------|------------|
| HGB040N06SL | TO-263 | GB040N06SL |
| HGP040N06SL | TO-220 | GP040N06SL |

Absolute Maximum Ratings at $T_J=25$ (unless otherwise specified)

| Parameter | Symbol | Conditions | Value | Unit |
|--|----------------|-------------------|------------|------|
| Continuous Drain Current (Silicon Limited) | I_D | $T_C=25$ | 140 | A |
| | | $T_C=100$ | 100 | |
| Continuous Drain Current (Package Limited) | | $T_C=25$ | 120 | |
| Drain to Source Voltage | V_{DS} | - | 60 | V |
| Gate to Source Voltage | V_{GS} | - | ± 20 | V |
| Pulsed Drain Current | I_{DM} | - | 410 | A |
| Avalanche Energy, Single Pulse | E_{AS} | $L=0.3mH, T_C=25$ | 240 | mJ |
| Power Dissipation | P_D | $T_C=25$ | 176 | W |
| Operating and Storage Temperature | T_J, T_{stg} | - | -55 to 175 | |

Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|-------------------------------------|-----------------|------|--------------|
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 0.85 | W/W |
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 60 | W/W |

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

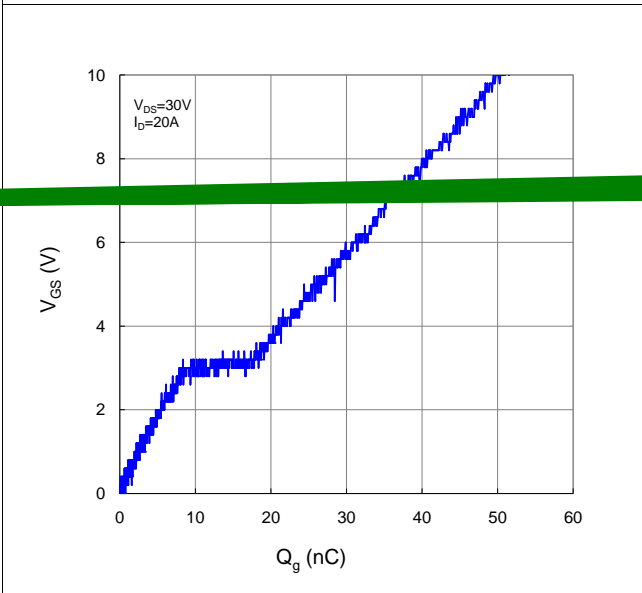


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

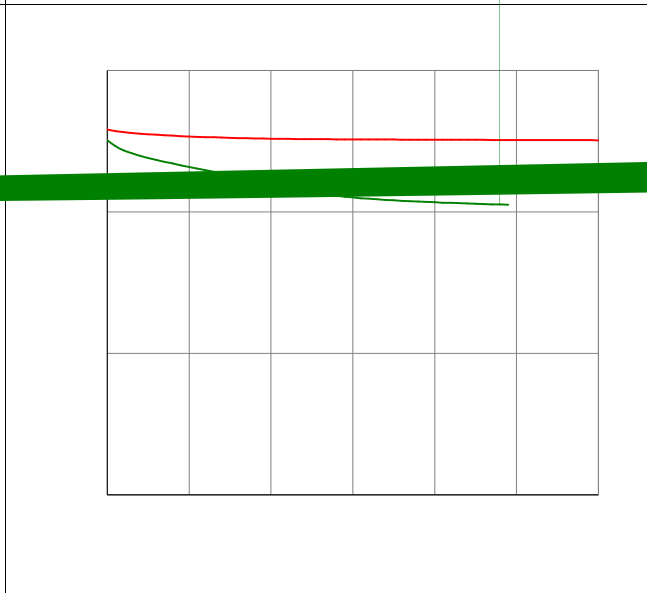


Figure 9. Maximum Safe Operating Area

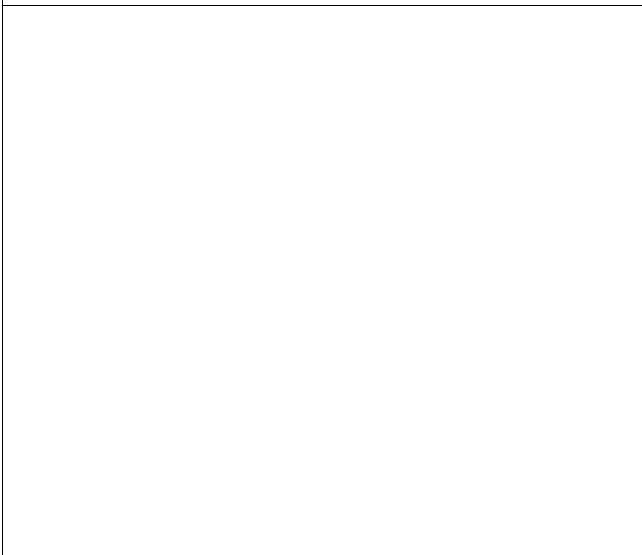


Figure 10. Maximun Drain Current vs. Case Temperature

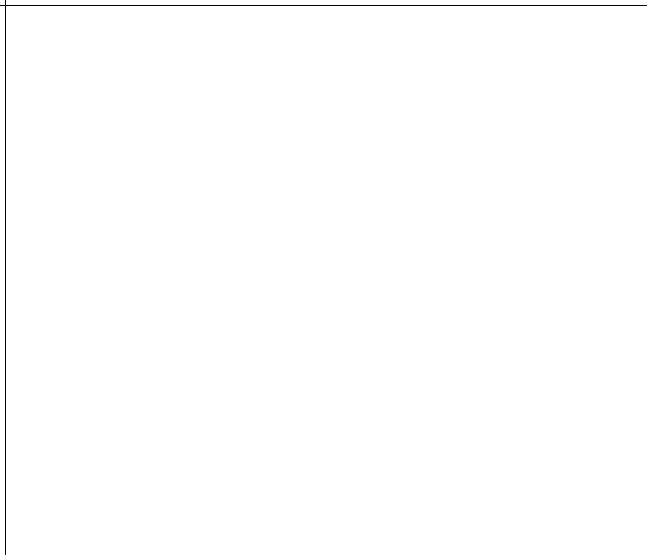
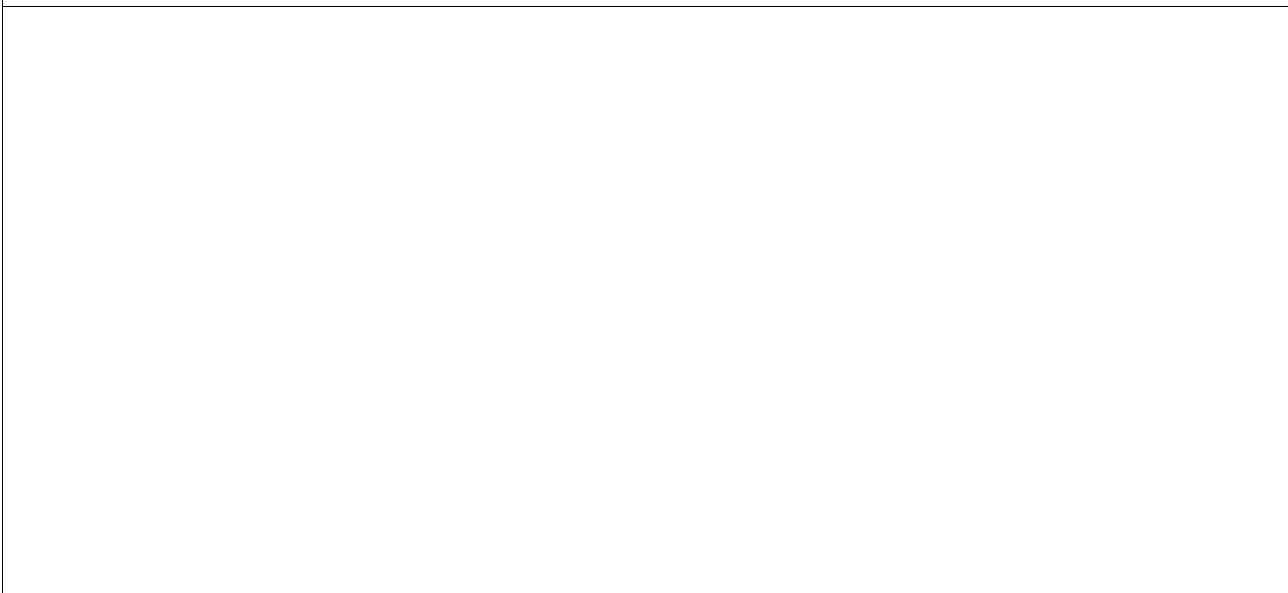


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



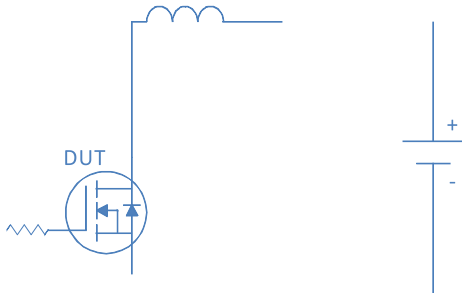
Inductive switching Test

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Gate Charge Test

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Uclamped Inductive Switching (UIS) Test

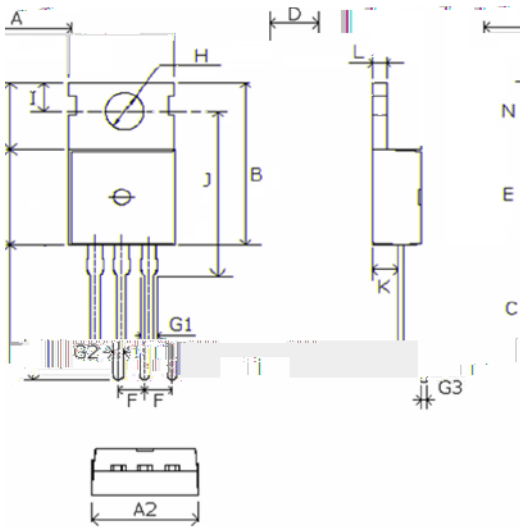
| | |
|---|--|
|  <p>The diagram illustrates the UIS test circuit. It features a MOSFET labeled 'DUT' in series with an inductor and a diode. The MOSFET's gate is connected to a resistor and a voltage source. The drain is connected to the inductor, which is then connected to the diode's anode. The diode's cathode is connected to the MOSFET's source, which is also connected to the negative terminal of a DC voltage source. The positive terminal of the DC source is connected to the MOSFET's drain.</p> | |
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Diode Recovery Test

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Package Outline

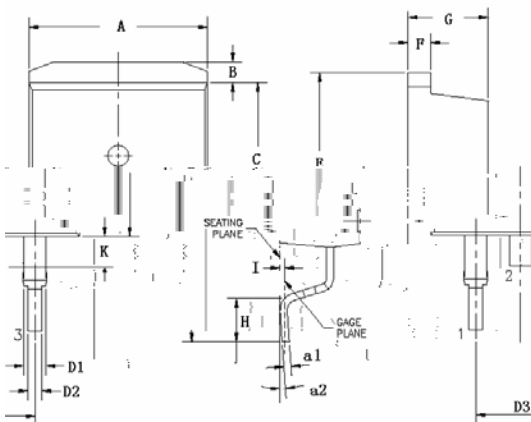
TO-220, 3 leads



Dimensions in mm unless otherwise specified

| Symbol | Min | Nom | Max |
|--------|-------|-------|-------|
| A | 9.66 | 9.97 | 10.28 |
| A2 | 9.80 | 10.00 | 10.20 |
| B | 15.60 | 15.70 | 15.80 |
| C | 12.70 | 13.48 | 14.27 |
| D | 4.30 | 4.50 | 4.70 |
| E | 9.00 | 9.20 | 9.40 |
| F | | 2.54 | |
| G1 | 1.32 | 1.52 | 1.72 |
| G2 | 0.70 | 0.82 | 0.95 |
| G3 | 0.45 | 0.52 | 0.60 |
| H | 3.50 | 3.60 | 3.70 |
| I | 2.70 | 2.80 | 2.90 |
| J | 15.70 | 15.97 | 16.25 |
| K | 2.20 | 2.40 | 2.60 |
| L | 1.15 | 1.27 | 1.40 |
| N | 6.40 | 6.60 | 6.80 |

TO-263, 2 leads



Dimensions in mm unless otherwise specified

| Symbol | Min | Nom | Max |
|------------|-------|-------|-------|
| A | 9.66 | 9.97 | 10.28 |
| B | 1.02 | 1.17 | 1.32 |
| C | 8.59 | 9.00 | 9.40 |
| D1 | 1.14 | 1.27 | 1.40 |
| D2 | 0.70 | 0.83 | 0.95 |
| D3 | | 5.08 | |
| E | 15.09 | 15.24 | 15.39 |
| F | 1.15 | 1.28 | 1.40 |
| G | 4.30 | 4.50 | 4.70 |
| H | 2.29 | 2.54 | 2.79 |
| I | | 0.25 | |
| K | 1.30 | 1.45 | 1.60 |
| a1 | 0.45 | 0.55 | 0.65 |
| a2(degree) | 0° | | 8° |