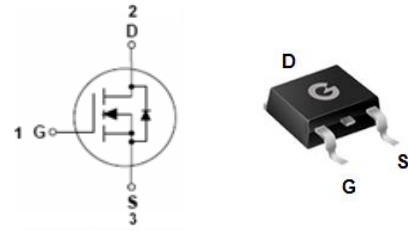


Features

- Super low gate charge
- Green device available
- Excellent C_{dV} / d_t effect decline
- Advanced high cell density trench technology

HF



TO-252

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|-------------|---------|---|--------------|
| BL024N03D | TO-252 | 80 pcs / Tube or 2500 pcs / Tape & Reel | 024N03D |

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|-----------|----------|------|
| Drain-to-Source Voltage | V_{DSS} | 30 | V |
| Gate-to-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current ($T_C = 25^\circ\text{C}$) ^{*1} | I_D | 130 | A |
| Continuous Drain Current ($T_C = 100^\circ\text{C}$) ^{*1} | | 95 | A |
| Pulsed Drain Current ^{*2} | I_{DM} | 350 | A |
| Single Pulse Avalanche Energy ^{*3} | E_{AS} | 168 | mJ |

Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|-----------------|------------|---------------------------|
| Power Dissipation ($T_C = 25^\circ\text{C}$) | P_D | 48 | W |
| Thermal Resistance Junction-to-Air ^{*1} | $R_{\theta JA}$ | 50 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-to-Case ^{*1} | $R_{\theta JC}$ | 2.6 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-to-Lead ^{*1} | $R_{\theta JL}$ | 2.0 | $^\circ\text{C}/\text{W}$ |
| Operating Junction Temperature Range | T_J | -55 ~ +150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 ~ +150 | $^\circ\text{C}$ |

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

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|--|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| V_{DSS} | Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 30V, V_{GS} = 0V, T_C = 25^\circ\text{C}$ | - | - | 1 | μA |
| | | $V_{DS} = 30V, V_{GS} = 0V, T_C = 55^\circ\text{C}$ | - | - | 5 | μA |
| I_{GSS} | Gate-Body Leakage Current | $V_{GS} = \pm 20V, V_{DS} = 0V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $R_{DS(ON)}$ | Static Drain-Source On-resistance ^{*2} | $V_{GS} = 10V, I_D = 30A$ | - | - | 2.4 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 20A$ | - | - | 3.6 | m Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.2 | - | 2.3 | V |
| Dynamic Characteristics | | | | | | |
| C_{ISS} | Input Capacitance | $V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0\text{MHz}$ | - | 3032 | - | pF |
| C_{OSS} | Output Capacitance | | - | 1588 | - | |
| C_{RSS} | Reverse Transfer Capacitance | | - | 207 | - | |
| Switching Characteristics | | | | | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD} = 15V$ $V_{GS} = 10V$ $R_G = 3.0\Omega$ $I_D = 20A$ | - | 12 | - | ns |
| t_r | Turn-on Rise Time | | - | 6 | - | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | - | 38.5 | - | |
| t_f | Turn-Off Fall Time | | - | 11.5 | - | |
| Q_G | Total Gate-Charge | $V_{DD} = 15V$ $V_{GS} = 10V$ $I_D = 20A$ | - | 21 | - | nC |
| Q_{GS} | Gate to Source Charge | | - | 12.5 | - | |
| Q_{GD} | Gate to Drain (Miller) Charge | | - | 14.5 | - | |
| Source-Drain Diode Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage ^{*2} | $I_{SD} = 20A, V_{GS} = 0V, T_J = 25^\circ\text{C}$ | - | - | 1.2 | V |
| I_S | Diode Continuous Forward Current ^{*1, 4} | | - | - | 130 | A |
| I_{SM} | Pulsed Source-Drain Current ^{*2, 4} | | - | - | 350 | A |

Notes:

1. The data tested by surface mounted on a 1 inch² board with 2 OZ copper
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.5\text{mH}$

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

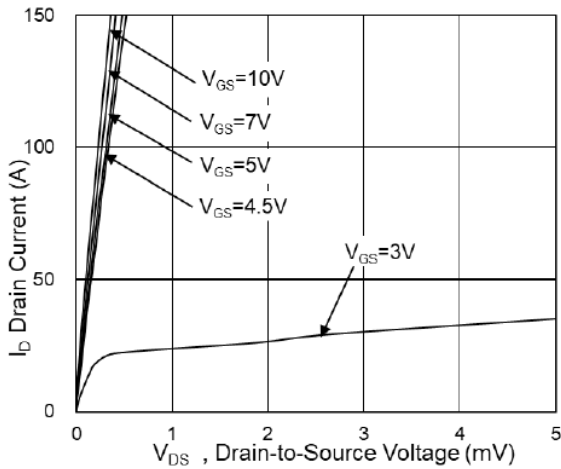


Fig.1 Typical Output Characteristics

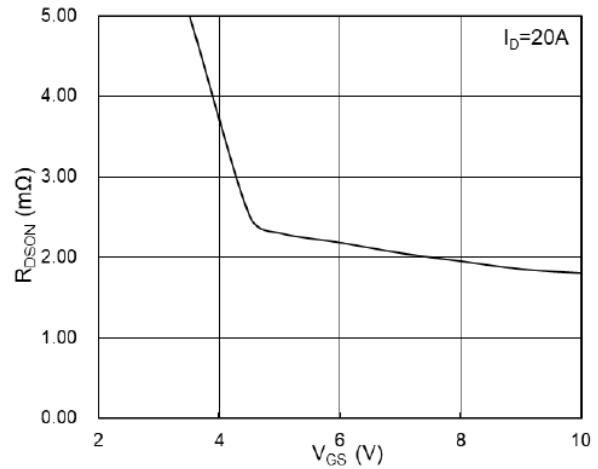


Fig.2 On-Resistance vs G-S Voltage

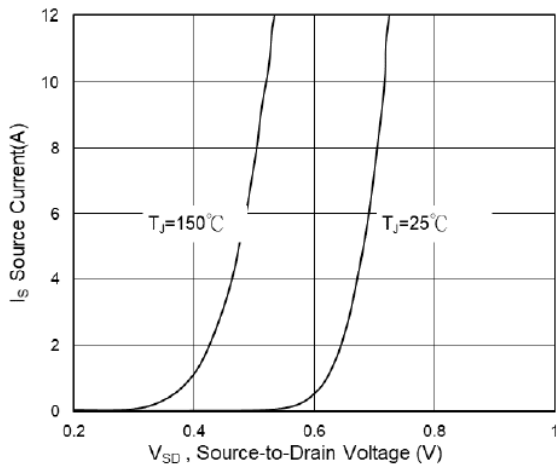


Fig.3 Source Drain Forward Characteristics

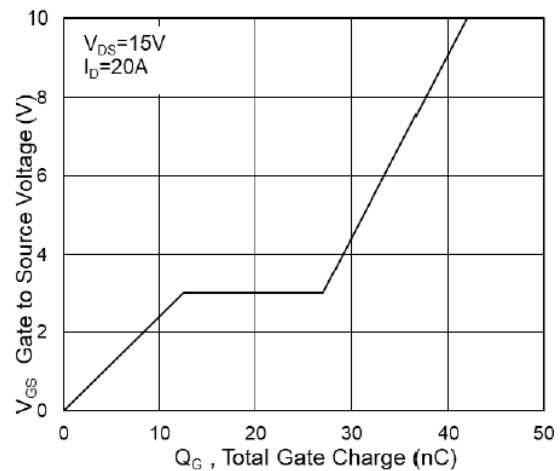


Fig.4 Gate-Charge Characteristics

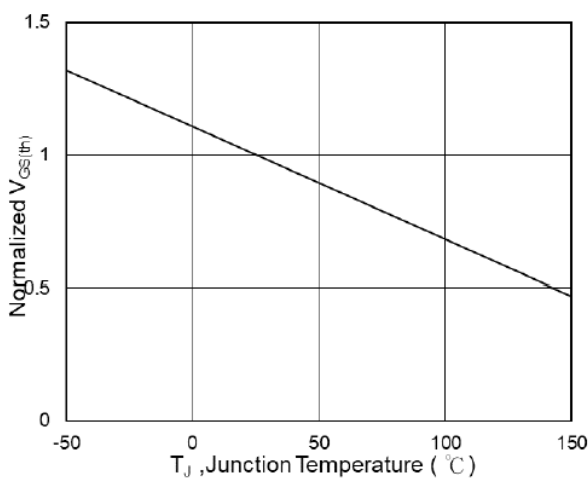


Fig.5 Normalized $V_{GS(th)}$ vs T_J

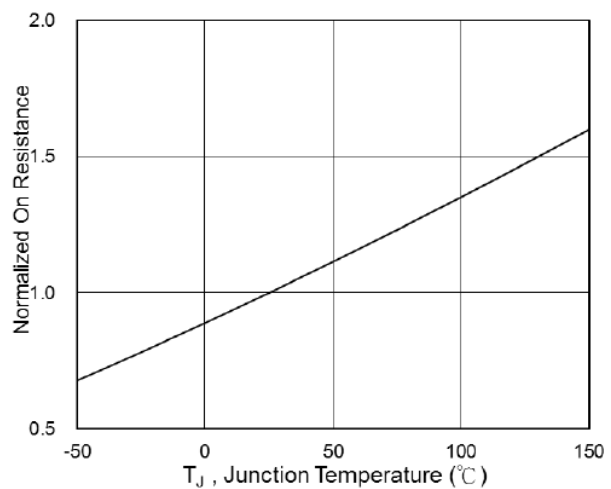


Fig.6 Normalized $R_{DS(on)}$ vs T_J

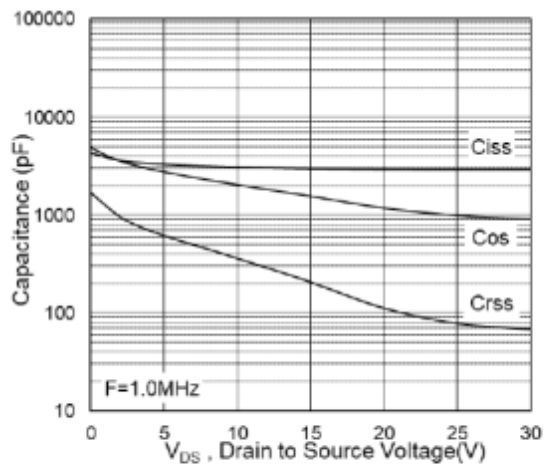


Fig.7 Capacitance

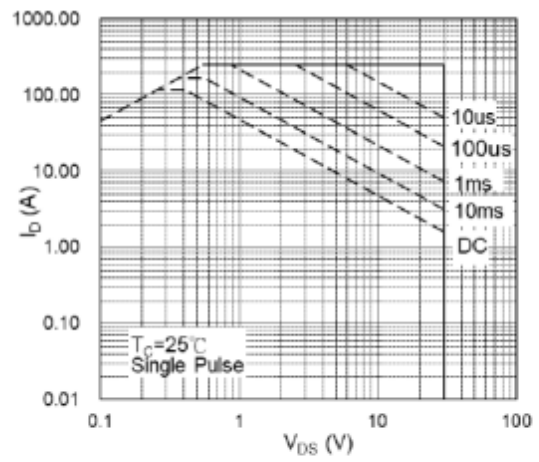
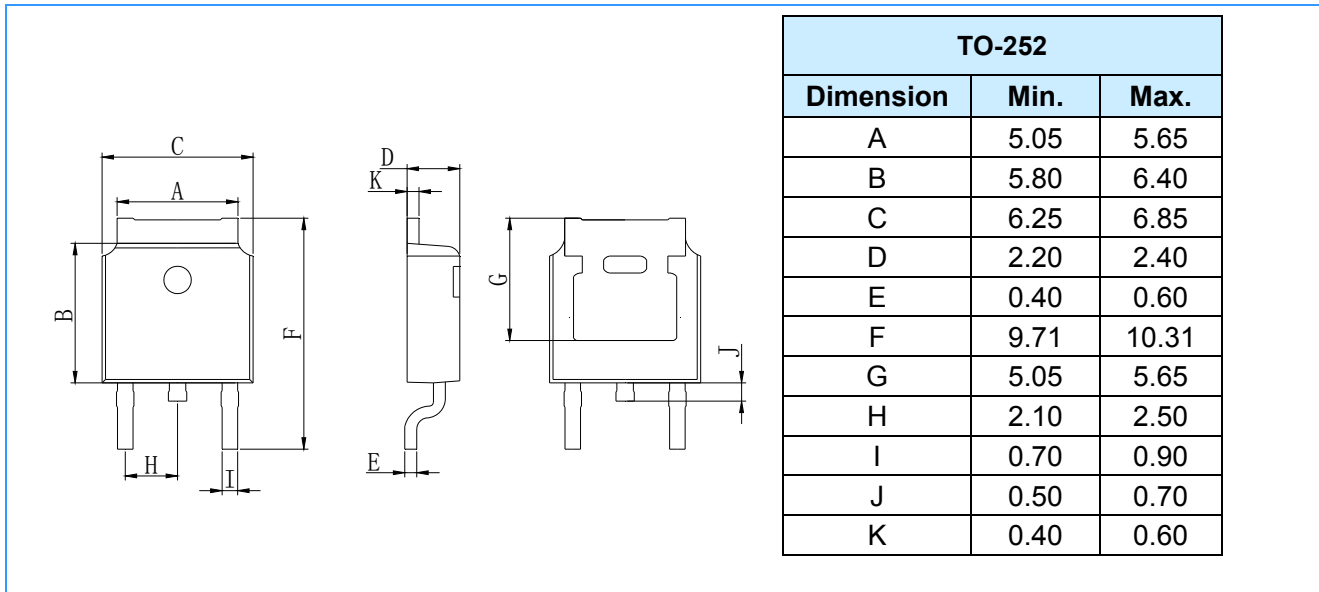
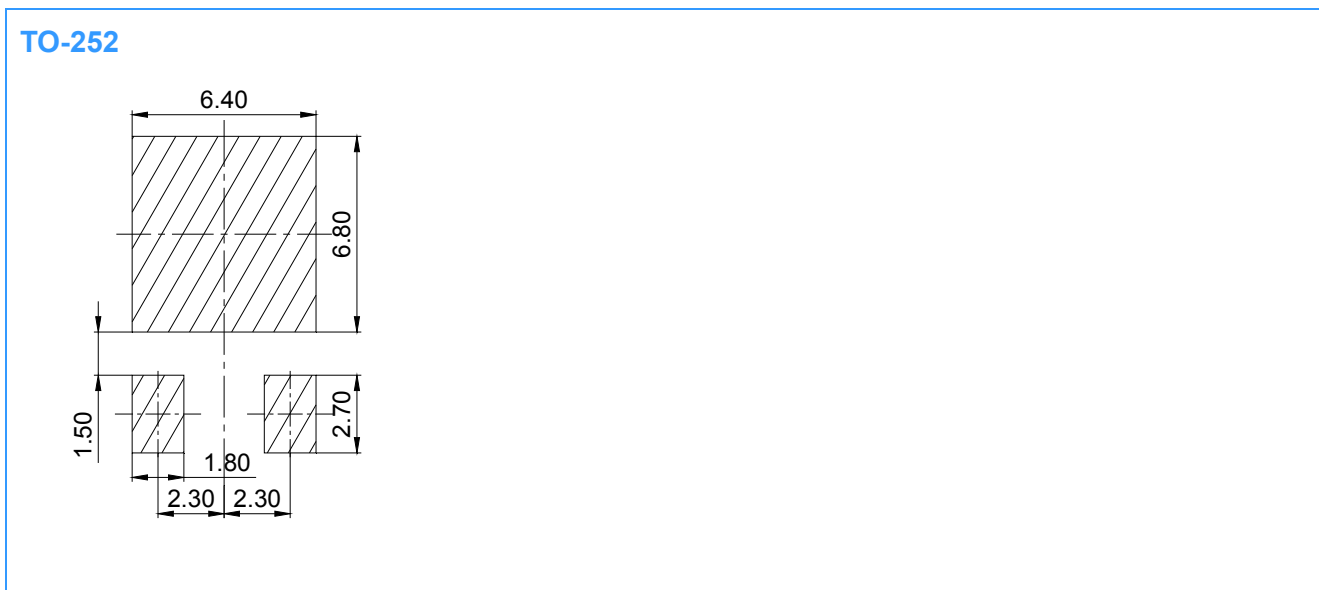


Fig.8 Safe Operating Area

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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