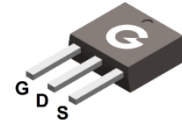
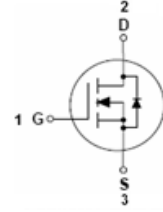


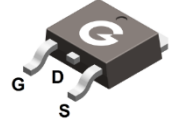
Features

- Advanced trench technology
- Low $R_{DS(ON)}$
- Low gate charge
- Fast switching speed
- HBM: JESD22-A114-B: 1A

HF



TO-251



TO-252

Mechanical Data

- Case: TO-251, TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matted-Tin plated; Solderable Per MIL-STD-202, Method 208

Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|-------------|---------|---|--------------|
| BL7N15I | TO-251 | 80 pcs / Tube | 7N15I |
| BL7N15D | TO-252 | 80 pcs / Tube or 2500 pcs / Tape & Reel | 7N15D |

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

| Parameter | Symbol | Value | Unit |
|---|-----------|-----------------|------------------|
| Drain-to-Source Voltage | V_{DS} | 150 | V |
| Gate-to-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_C = 25^\circ\text{C}$) | I_D | 7.5 | A |
| Continuous Drain Current ($T_C = 100^\circ\text{C}$) | | 4.7 | A |
| Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*1} | | 2 | A |
| Continuous Drain Current ($T_A = 100^\circ\text{C}$) ^{*1} | | 1.3 | A |
| Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$) | I_{DM} | 30 | A |
| Single Pulse Avalanche Energy ^{*3} | E_{AS} | 5 | mJ |
| Power Dissipation ($T_C = 25^\circ\text{C}$) | P_D | 39 | W |
| Operating Junction Temperature Range | T_J | $-55 \sim +150$ | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | $-55 \sim +150$ | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--|-----------------|------|------|------|--------------------|
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | - | - | 3.2 | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Air ^{*1} | $R_{\theta JA}$ | - | - | 45 | $^\circ\text{C/W}$ |

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

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|--|-----------------------------------|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| V_{DSS} | Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 150 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 150V, V_{GS} = 0V$ | - | - | 1 | μA |
| I_{GSS} | Gate-Body Leakage Current | $V_{GS} = \pm 20V, V_{DS} = 0V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $R_{DS(ON)}$ | Drain-Source On-resistance ^{*2} | $V_{GS} = 10V, I_D = 5A$ | - | 250 | 290 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 5A$ | - | 260 | 320 | m Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1 | 1.7 | 2.5 | V |
| R_G | Gate Resistance | $V_{GS} = 0V, f = 1MHz$ | - | 3.3 | - | Ω |
| Dynamic Characteristics | | | | | | |
| C_{ISS} | Input Capacitance | $V_{GS} = 0V$ | - | 708 | - | pF |
| C_{OSS} | Output Capacitance | $V_{DS} = 25V$ | - | 29 | - | |
| C_{RSS} | Reverse Transfer Capacitance | $f = 1MHz$ | - | 18 | - | |
| Switching Characteristics | | | | | | |
| $t_{d(ON)}$ | Turn-on Delay Time ^{*4} | $V_{DD} = 75V$ | - | 9 | - | ns |
| t_r | Turn-on Rise Time ^{*4} | $V_{GS} = 10V$ | - | 11 | - | |
| $t_{d(OFF)}$ | Turn-Off Delay Time ^{*4} | $R_G = 6\Omega$ | - | 24 | - | |
| t_f | Turn-Off Fall Time ^{*4} | $R_L = 25\Omega$ | - | 8 | - | |
| Q_G | Total Gate-Charge | $V_{DD} = 75V$ | - | 17 | - | nC |
| Q_{GS} | Gate to Source Charge | $V_{GS} = 10V$ | - | 3.1 | - | |
| Q_{GD} | Gate to Drain (Miller) Charge | $I_D = 7A$ | - | 3.2 | - | |
| Source-Drain Diode Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage ^{*2} | $I_{SD} = 3.5A, V_{GS} = 0V$ | - | 0.8 | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD} = 7A, V_{GS} = 0V$ | - | 54 | - | ns |
| Q_{rr} | Reverse Recovery Charge | $di/dt = 100A/\mu s$ | - | 98 | - | nC |

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ 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 $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH$
4. Guaranteed by design, not subject to production

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

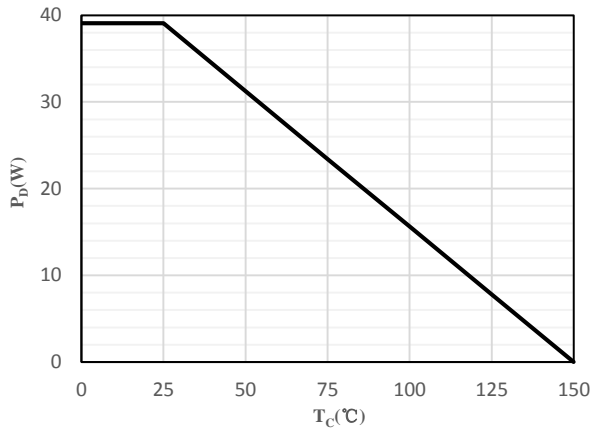


Fig 1 Power Dissipation

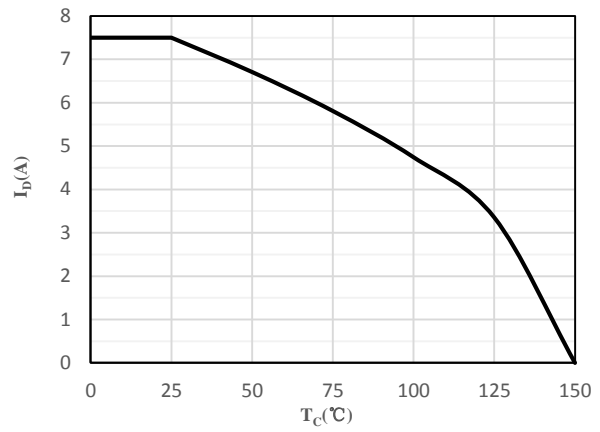


Fig 2 Drain Current

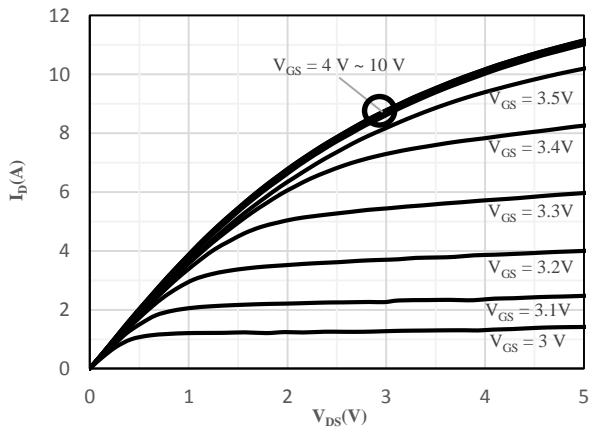


Fig 3 Typical Output Characteristics

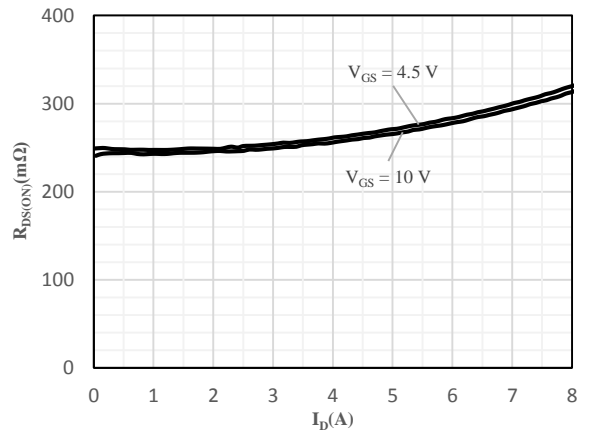


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

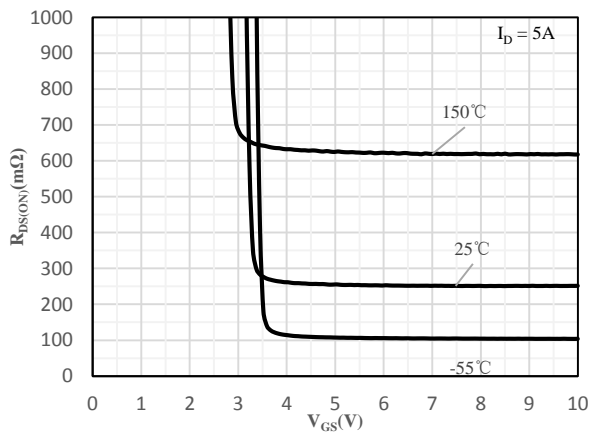


Fig 5 On-Resistance vs. Gate-Source Voltage

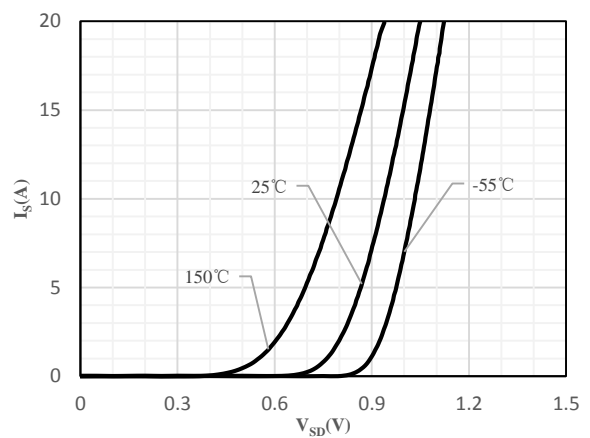


Fig 6 Body-Diode Characteristics

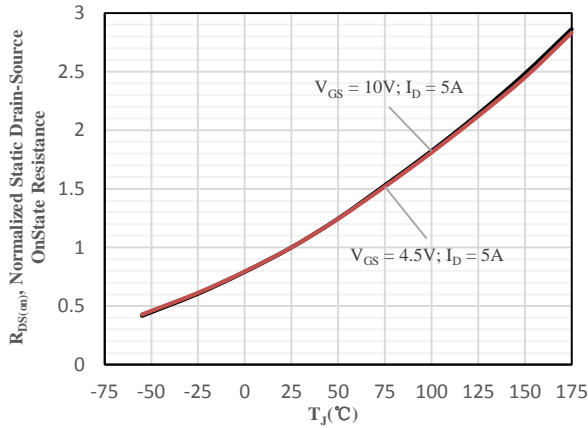


Fig 7 Normalized On-Resistance vs. Junction Temperature

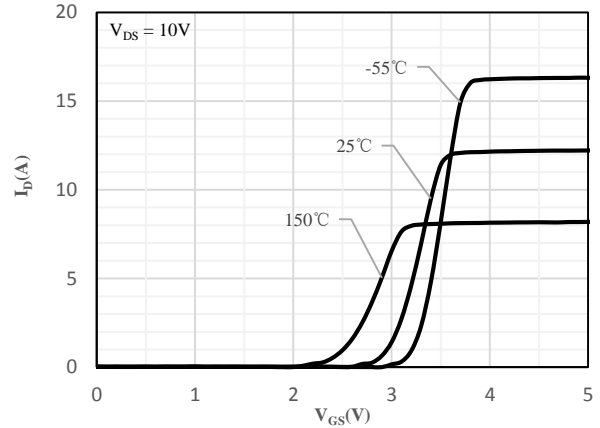


Fig 8 Transfer Characteristics

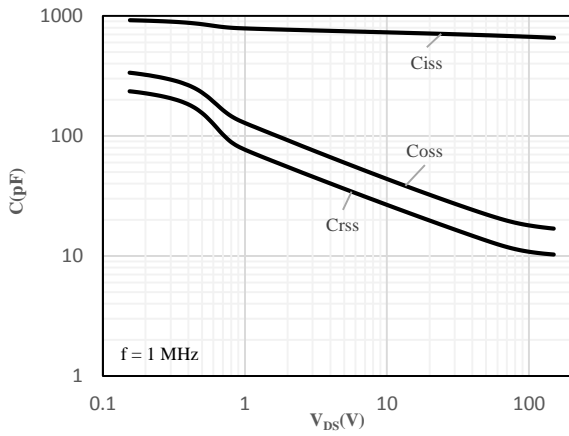


Fig 9 Capacitance Characteristics

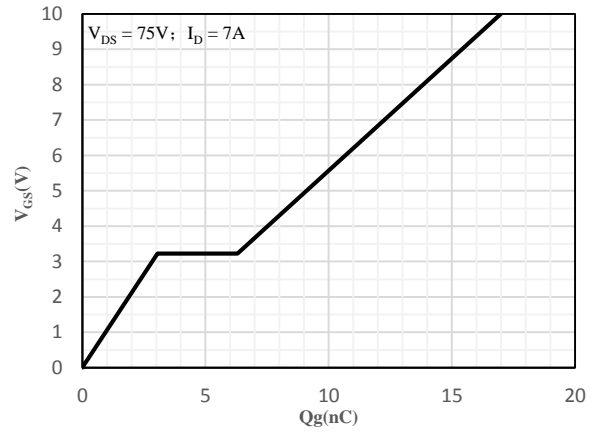


Fig 10 Gate-Charge Characteristics

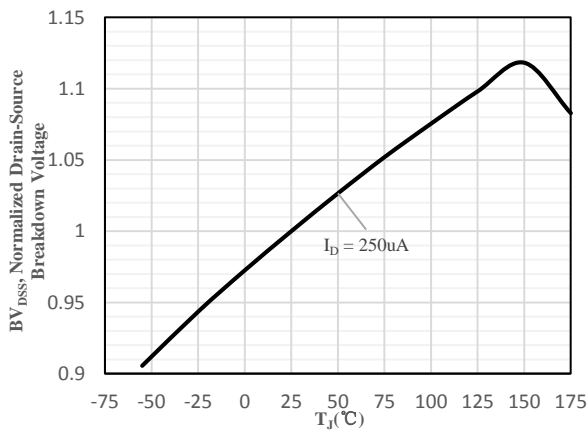


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

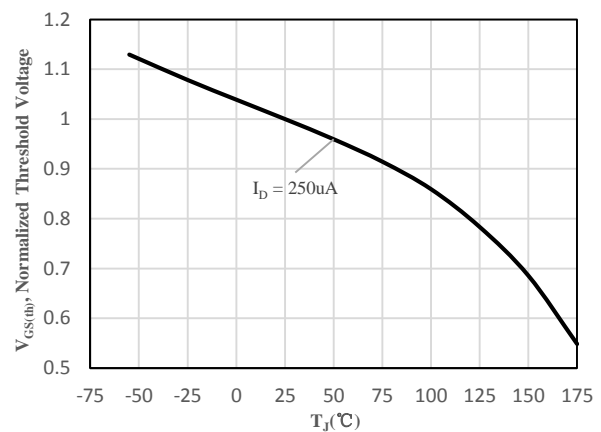
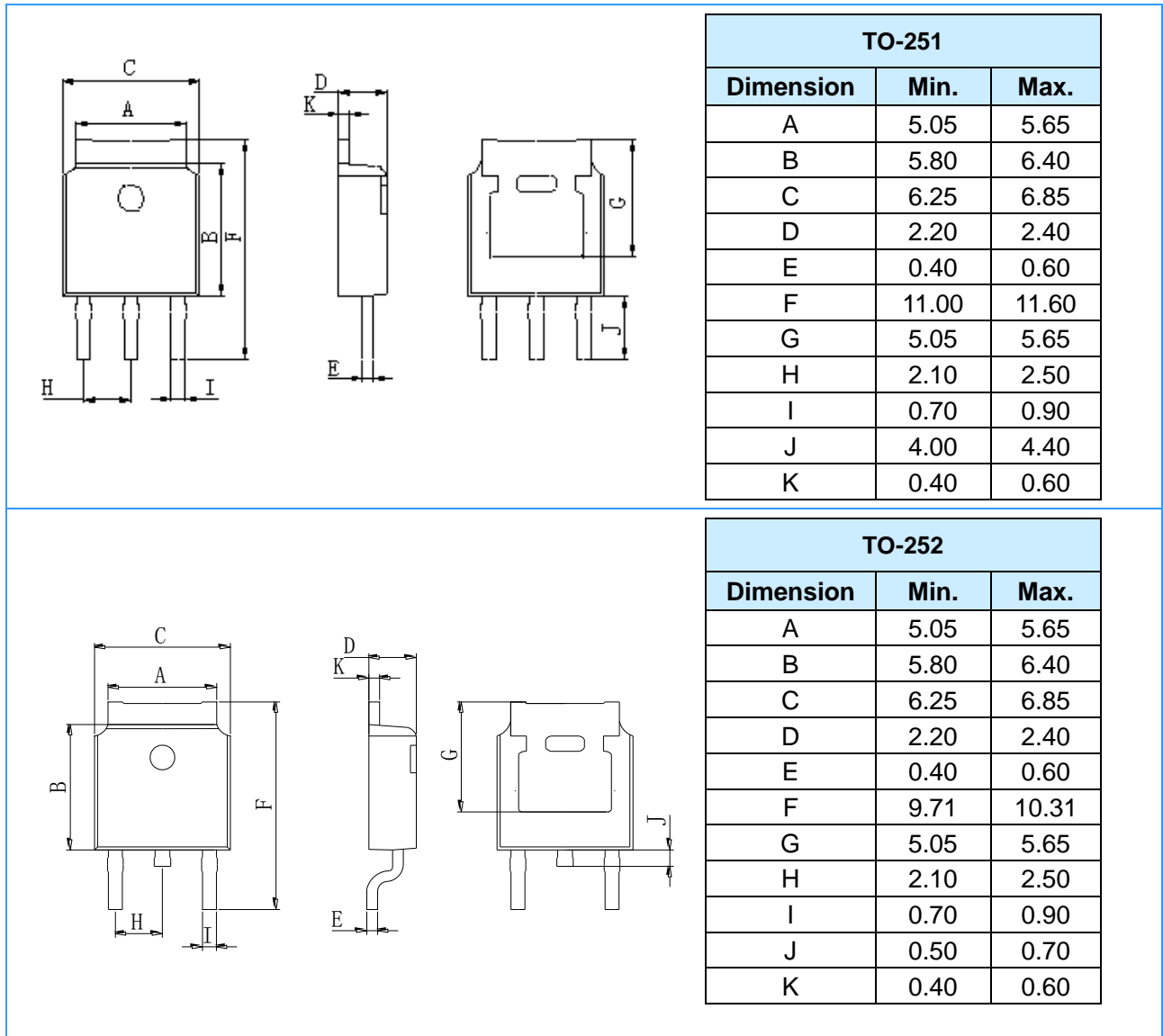
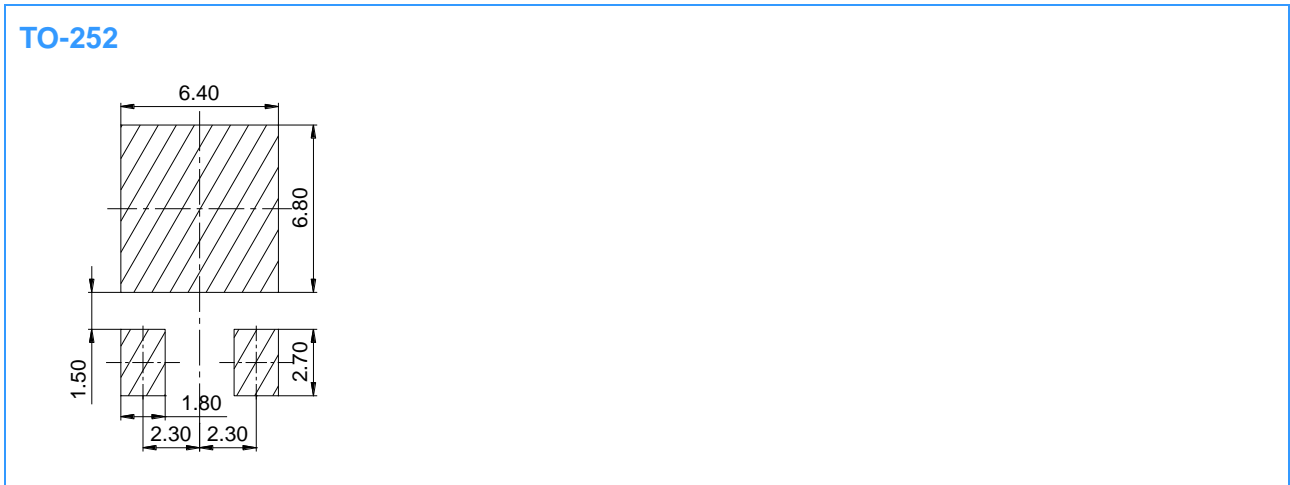


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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