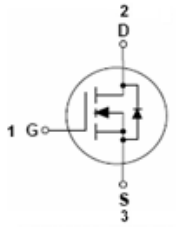
# N-Channel Enhancement Mode MOSFET

## BL03N10C

## Features

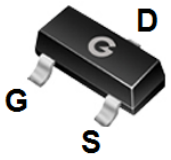
HF

- Electrostatic sensitive devices
- Excellent package for good heat dissipation




## APPLICATIONS

- Power switching application
- Hard switching and high frequency circuits
- Uninterruptible power supply




SOT-23

## Mechanical Data

- Case: SOT-23
- 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 |
|---|---|---|---|
| BL03N10C | SOT-23 | 3000 pcs / Tape & Reel | 03N10 |

## Maximum Ratings (@ $T_A$ = 25℃ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | 100 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ | 3 | A |
| Pulsed Drain Current *2 | $I_{DM}$ | 12 | A |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation | $P_D$ | 0.35 | W |
| Thermal Resistance Junction-to-Air *1 | $R_{\theta JA}$ | 357 | °C/W |
| Thermal Resistance Junction-to-Lead *1 | $R_{\theta JL}$ | 214 | °C/W |
| Thermal Resistance Junction-to-Case *1 | $R_{\theta JC}$ | 180 | °C/W |
| Operating Junction Temperature Range | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

## Electrical Characteristics (@ $T_A$ = 25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| $V_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$ = 0V, $I_D$ = 250μA | 100 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 100V, $V_{GS}$ = 0V | - | - | 1 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $R_{DS(ON)}$ | Static Drain-Source On-resistance *2 | $V_{GS}$ = 10V,$I_D$ = 3A | - | 0.204 | 0.22 | Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1 | 2.1 | 2.5 | V |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$ = 5V, $I_D$ = 2.9A | - | - | 1.2 | S |
| **Dynamic Characteristics** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>f = 1.0MHz | - | 392 | - | pF |
| $C_{OSS}$ | Output Capacitance | | - | 24 | - | |
| $C_{RSS}$ | Reverse Transfer Capacitance | | - | 14 | - | |
| **Switching Characteristics** | | | | | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}$ = 30V, $V_{GS}$ = 10V<br>$R_G$ = 2.5Ω, $R_L$ = 15Ω<br>$I_D$ = 2A | - | 11 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 7.4 | - | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | - | 35 | - | |
| $t_f$ | Turn-Off Fall Time | | - | 9.1 | - | |
| $Q_G$ | Total Gate-Charge | $V_{DD}$ = 30V<br>$V_{GS}$ = 10V<br>$I_D$ = 2A | - | 12 | - | nC |
| $Q_{GS}$ | Gate to Source Charge | | - | 3 | - | |
| $Q_{GD}$ | Gate to Drain (Miller) Charge | | - | 1.6 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage *2 | $I_{SD}$ = 3A, $V_{GS}$ = 0V, $T_J$ = 25°C | - | - | 1.2 | V |

Notes:

1. Device mounted on FR-4 PCB
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%

## Ratings and Characteristics Curves (@ $T_A$ = 25°C unless otherwise specified)

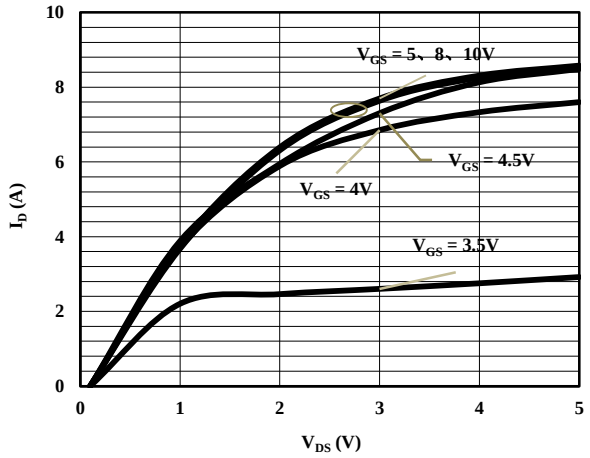



Fig 1 On-Region Characteristics

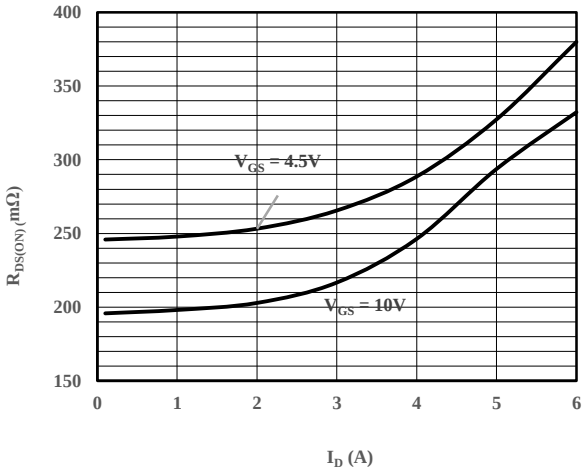



Fig 2 On-Resistance vs. Drain Current and Gate Voltage

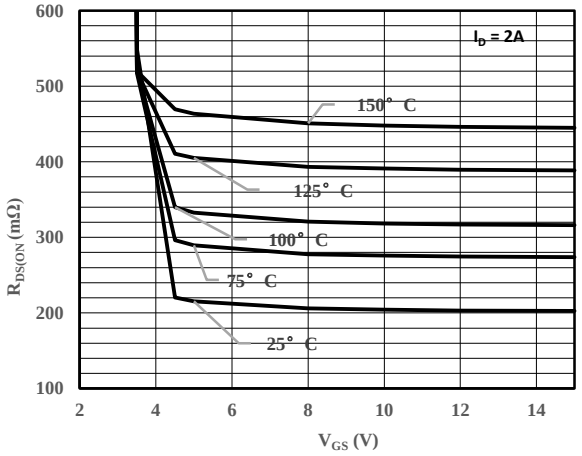



Fig 3 On-Resistance vs. Gate-Source Voltage

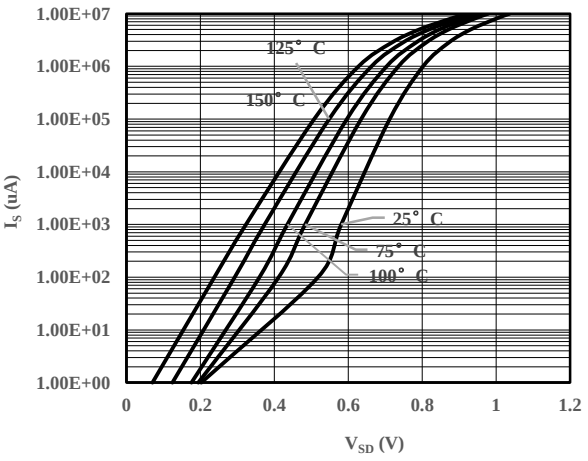



Fig 4 Body-Diode Characteristics

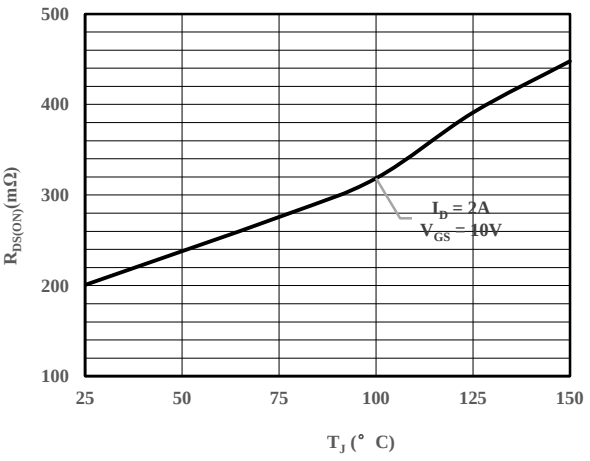



Fig 5 On-Resistance vs. Junction Temperature

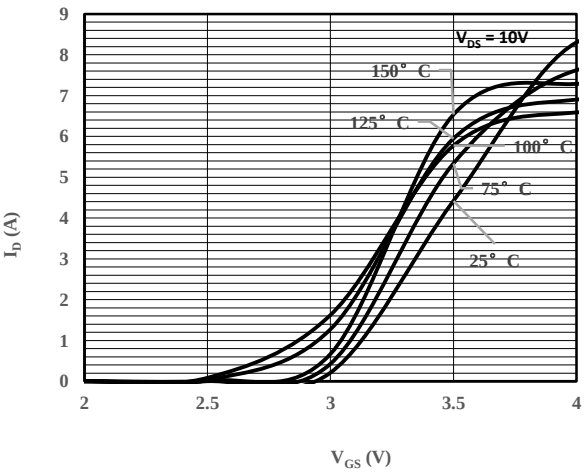



Fig 6 Transfer Characteristics

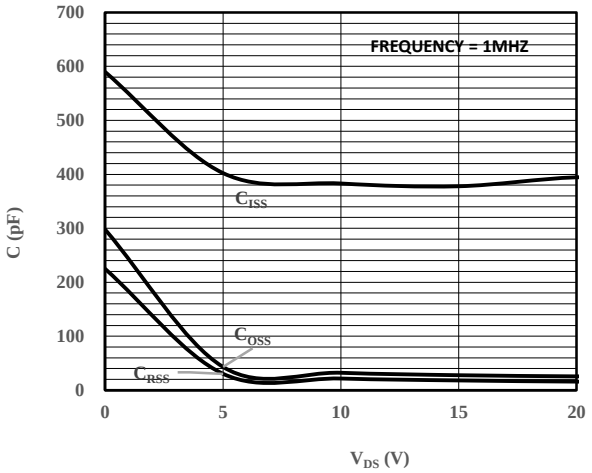



Fig 7 Capacitance Characteristics

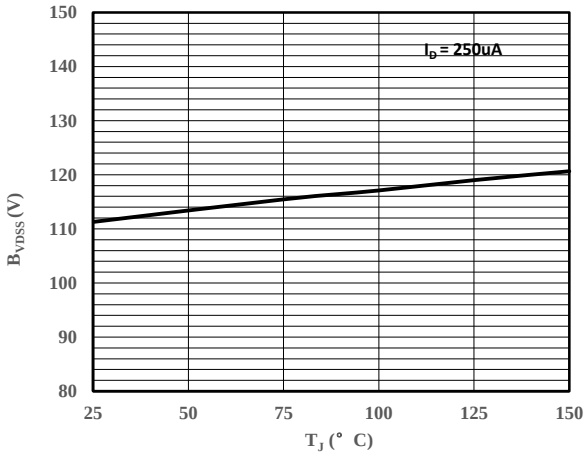



Fig 8 Drain-Source vs. Junction Temperature

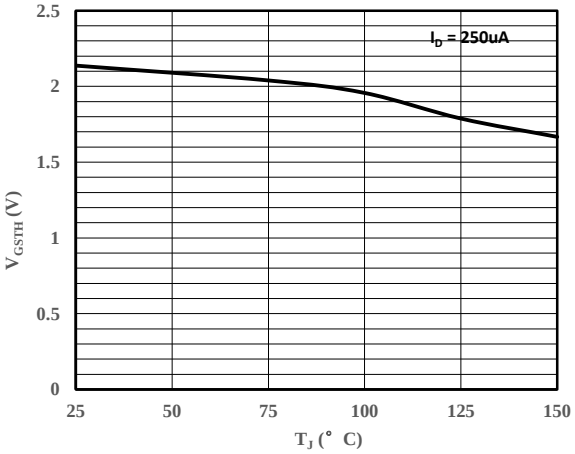
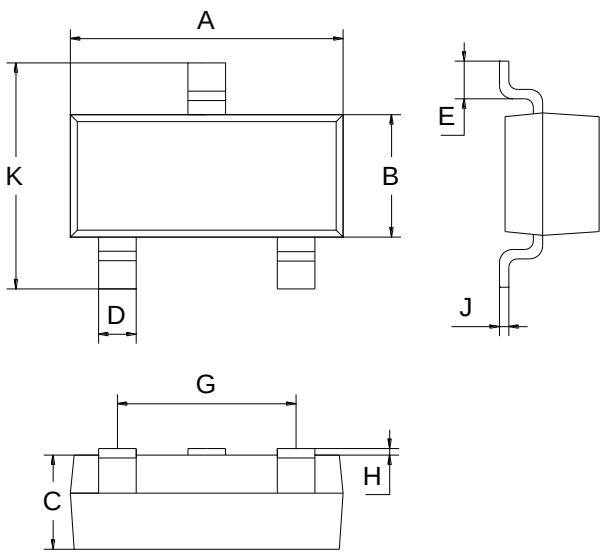



Fig 9 Gate Voltage vs. Junction Temperature

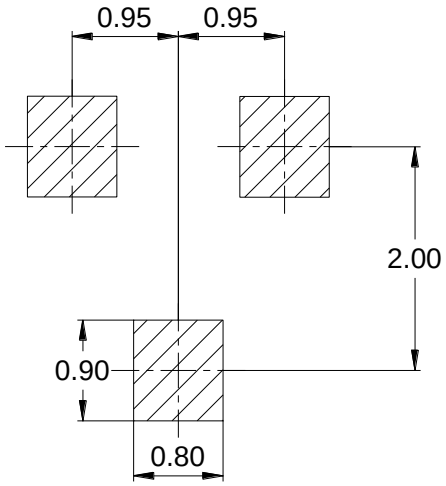
## Package Outline Dimensions (Unit: mm)




| SOT-23 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 2.70 | 3.10 |
| B | 1.10 | 1.50 |
| C | 0.90 | 1.10 |
| D | 0.30 | 0.50 |
| E | 0.35 | 0.48 |
| G | 1.80 | 2.00 |
| H | 0.02 | 0.10 |
| J | 0.05 | 0.15 |
| K | 2.20 | 2.60 |

## Mounting Pad Layout (Unit: mm)

### SOT-23




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