# Dual N-Channel Enhancement Mode MOSFET

## GBLN3303-S8

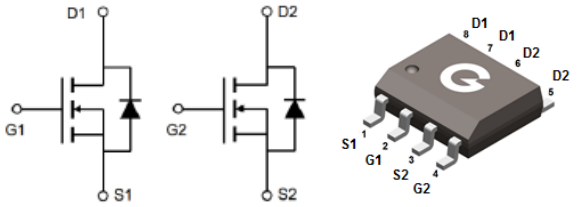
## Features

- Lower $R_{DS(on)}$
- Good stability and uniformity

HF

## Mechanical Data

- Case: SOP-8
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208




SOP-8

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| GBLN3303-S8 | SOP-8 | 4000 pcs / Tape & Reel | GBLN3303 |

## Maximum Ratings (@ $T_A$ = 25°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°C) | $I_D$ | 10 | A |
| Continuous Drain Current ($T_A$ = 25°C) *1 | | 6 | A |
| Continuous Drain Current ($T_A$ = 100°C) *1 | | 3.8 | A |
| Pulsed Drain Current ($t_p$ = 10μs, $T_A$ = 25°C) | $I_{DM}$ | 36 | A |
| Single Pulse Avalanche Energy *4 | $E_{AS}$ | 40 | mJ |
| Power Dissipation ($T_A$ = 25°C) *1 | $P_D$ | 2 | W |
| Operating Junction Temperature Range | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

## Thermal Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | - | 20 | 25 | °C/W |
| Thermal Resistance Junction-to-Air *1 | $R_{\theta JA}$ | - | 55 | 62.5 | °C/W |
| Thermal Resistance Junction-to-Air *2 | | - | 70 | 80 | °C/W |

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

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| $V_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$ = 0V, $I_D$ = 250μA | 30 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 24V, $V_{GS}$ = 0V | - | - | 1 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $R_{DS(ON)}$ | Drain-Source On-resistance *3 | $V_{GS}$ = 10V, $I_D$ = 6.3A | - | 18 | 30 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 4.8A | - | 25 | 45 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1 | 1.6 | 2.5 | V |
| $R_G$ | Gate Resistance | $V_{GS}$ = 0V, f = 1MHz | - | 8.4 | - | Ω |
| **Dynamic Characteristics** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{GS}$ = 0V<br>$V_{DS}$ = 15V<br>f = 1.0MHz | - | 492 | - | pF |
| $C_{OSS}$ | Output Capacitance | | - | 64 | - | |
| $C_{RSS}$ | Reverse Transfer Capacitance | | - | 59 | - | |
| **Switching Characteristics** | | | | | | |
| $t_{d(ON)}$ | Turn-on Delay Time *5 | $V_{DD}$ = 20V, $V_{GS}$ = 10V<br>$R_G$ = 3Ω, $R_L$ = 1Ω<br>$I_D$ = 8A | - | 10 | - | ns |
| $t_r$ | Turn-on Rise Time *5 | | - | 12 | - | |
| $t_{d(OFF)}$ | Turn-Off Delay Time *5 | | - | 32 | - | |
| $t_f$ | Turn-Off Fall Time *5 | | - | 8 | - | |
| $Q_G$ | Total Gate-Charge | $V_{DD}$ = 15V<br>$V_{GS}$ = 10V<br>$I_D$ = 5.8A | - | 14.6 | - | nC |
| $Q_{GS}$ | Gate to Source Charge | | - | 2.4 | - | |
| $Q_{GD}$ | Gate to Drain (Miller) Charge | | - | 2.9 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage *3 | $I_{SD}$ = 1A, $V_{GS}$ = 0V | - | 0.76 | 1.2 | V |
| trr | Reverse Recovery Time | $I_F$ = 5A, $V_{GS}$ = 0V<br>$d_{IF}/d_t$ = 100A/μs | - | 75 | - | ns |
| Qrr | Reverse Recovery Charge | | - | 36 | - | nC |

Notes:

1. The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper, t ≤ 10s
2. The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper, steady state
3. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
4. The $E_{AS}$ data shows Max. rating. The test condition is $V_{DD}$ = 25V, $V_{GS}$ = 10V, L = 10mH
5. Guaranteed by design, not subject to production

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

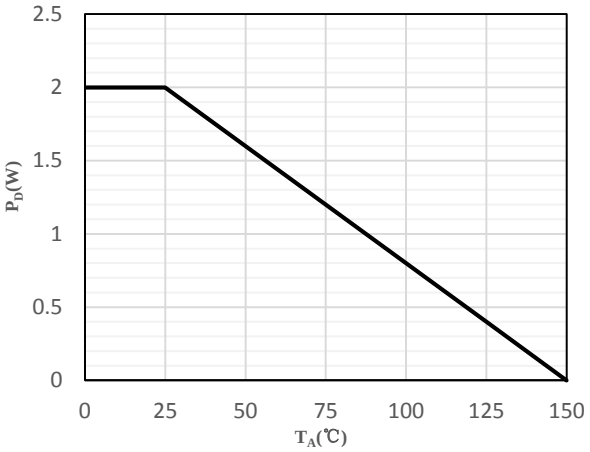



Fig 1 Power Dissipation

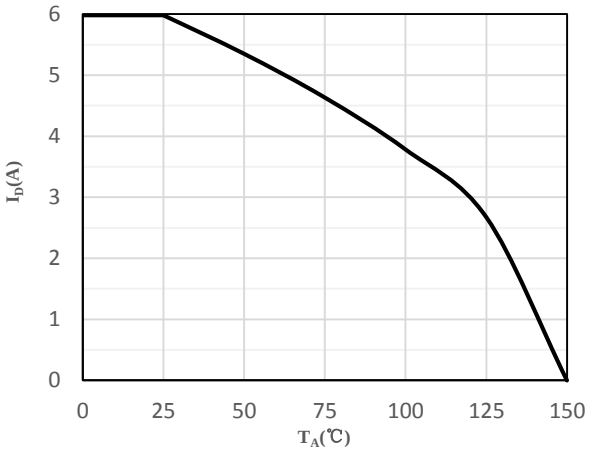



Fig 2 Drain Current

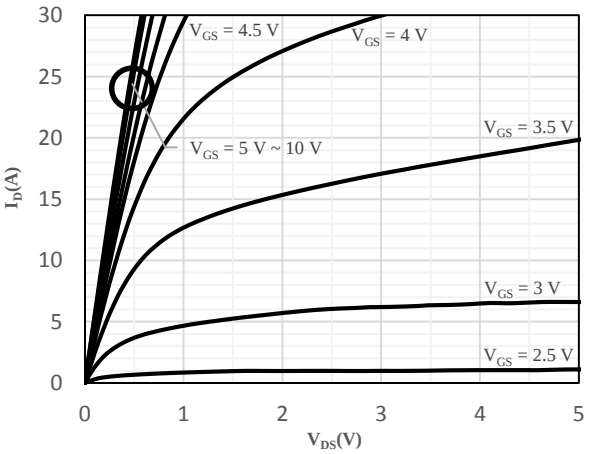



Fig 3 Typical Output Characteristics

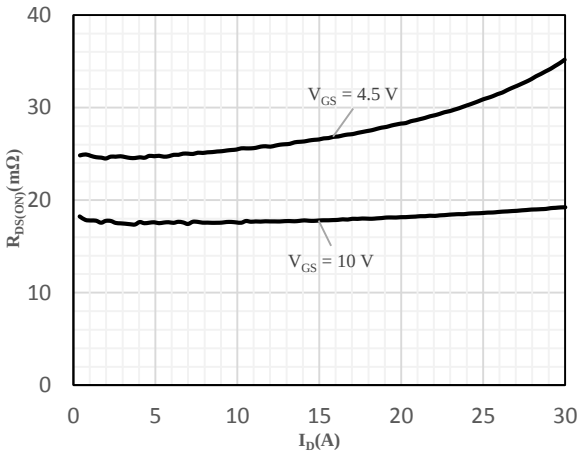



Fig 4 On-Resistance vs. Drain Current and Gate Voltage

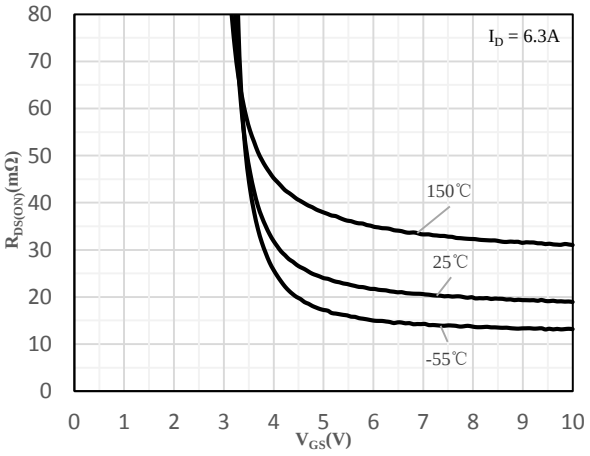



Fig 5 On-Resistance vs. Gate-Source Voltage

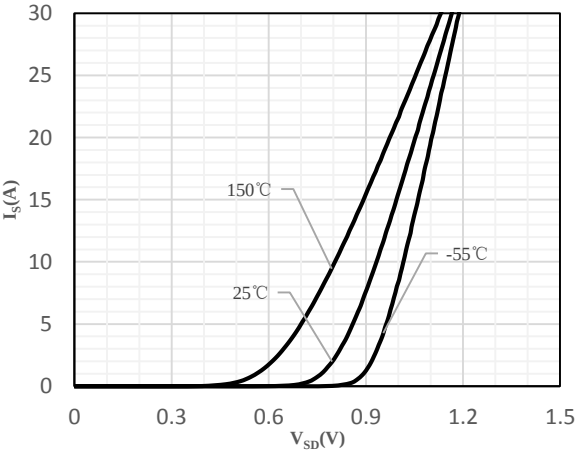



Fig 6 Body-Diode Characteristics

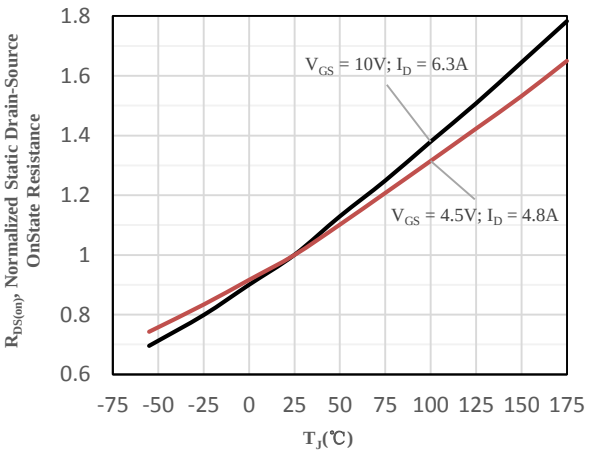



Fig 7 Normalized On-Resistance vs. Junction Temperature

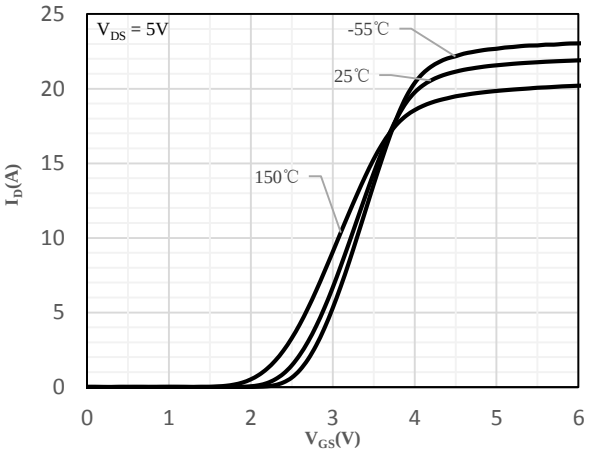



Fig 8 Transfer Characteristics

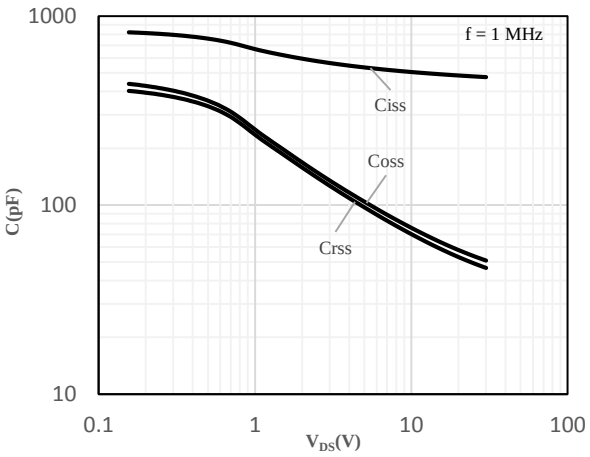



Fig 9 Capacitance Characteristics

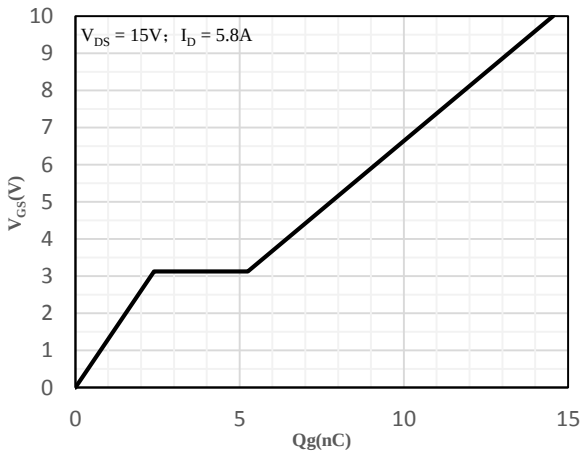



Fig 10 Gate-Charge Characteristics

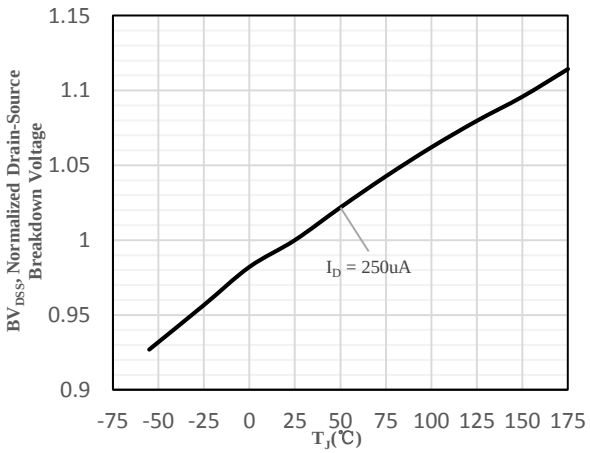



Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

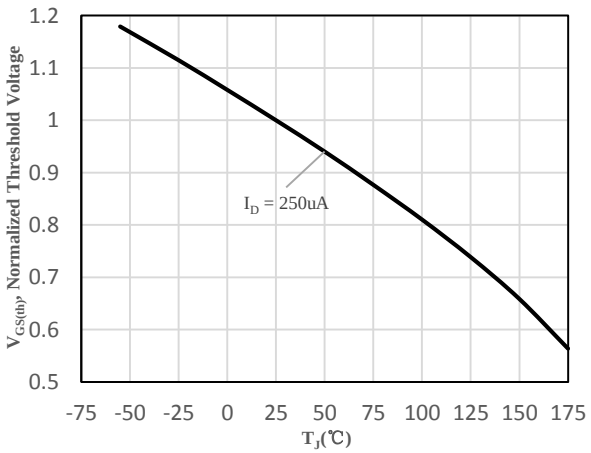



Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

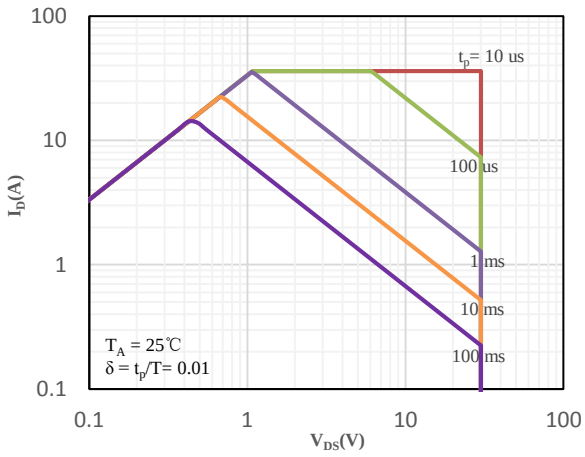



Fig 13 Safe Operation Area

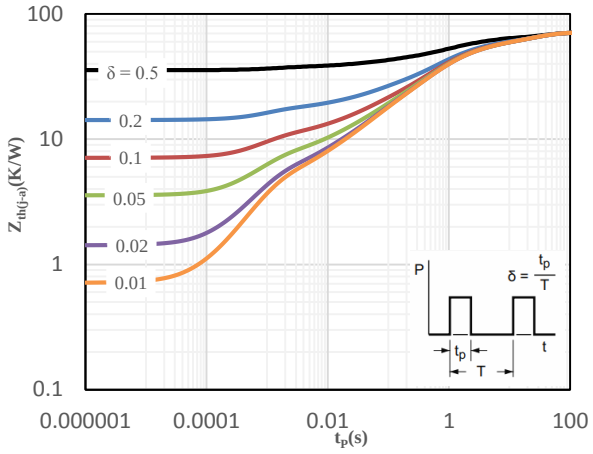
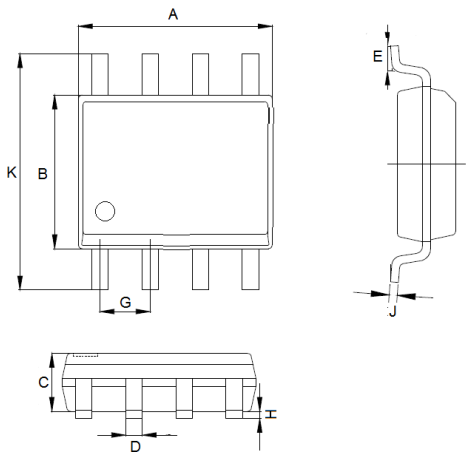



Fig 14 Maximum transient thermal impedance

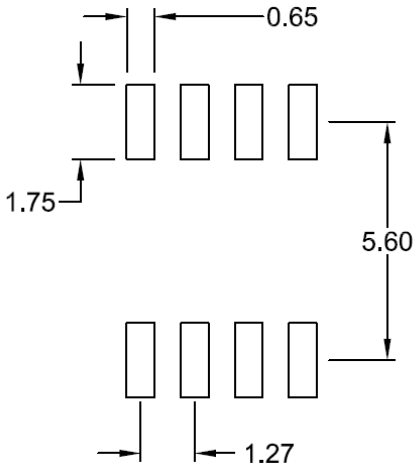
## Package Outline Dimensions (Unit: mm)




| SOP-8 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 4.80 | 5.20 |
| B | 3.80 | 4.20 |
| C | 1.30 | 1.50 |
| D | 0.30 | 0.50 |
| E | 0.40 | 1.00 |
| G | 1.17 | 1.37 |
| H | 0.10 | 0.30 |
| J | 0.10 | 0.30 |
| K | 5.80 | 6.20 |

## Mounting Pad Layout (Unit: mm)

### SOP-8

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