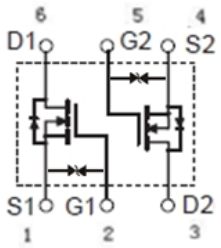
# Dual N-Channel Enhancement Mode MOSFET

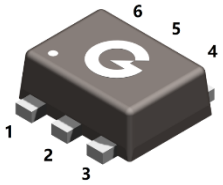
# BSS3541V

## Features

- Advanced planar technology
- Low input capacitance
- High-speed switching
- Drive circuits can be simple
- HBM: JESD22-A114-B: 1C
- RoHS compliant with Halogen-free

HF




SOT-563

## Mechanical Data

- Case: SOT-563
- 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 |
|---|---|---|---|
| BSS3541V | SOT-563 | 3000 pcs / Tape & Reel | 3541 |

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

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 30 | V |
| Gate -Source Voltage | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current ($T_A$ = 25°C) *1 | $I_D$ | 100 | mA |
| Continuous Drain Current ($T_A$ = 70°C) *1 | | 80 | |
| Pulsed Drain Current ($t_p$ =10μs, $T_A$ = 25°C) | $I_{DM}$ | 400 | mA |
| Power Dissipation ($T_A$ = 25°C) *1 | $P_D$ | 0.15 | 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-Air *1 | $R_{\theta JA}$ | - | - | 833 | °C/W |

## 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, $I_D$ = 10μA | 30 | - | - | V |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$ = 30V, $V_{GS}$ = 0V | - | - | 1 | μA |
| $I_{GSS}$ | Gate-body Leakage | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±1 | μA |
| **On Characteristics** | | | | | | |
| $R_{DS(ON)}$ | Drain-Source On-resistance *2 | $V_{GS}$ = 4V, $I_D$ = 10mA | - | 4 | 8 | Ω |
| | | $V_{GS}$ = 2.5V, $I_D$ = 1mA | - | 6 | 13 | |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$ = 3V, $I_D$ = 100μA | 0.8 | 1.25 | 1.5 | V |
| $R_G$ | Gate Resistance | $V_{GS}$ = 0V, f = 1MHz | - | 288 | - | Ω |
| $g_{fs}$ | Transconductance | $V_{DS}$ = 3V, $I_D$ = 10mA | 20 | - | - | mS |
| **Dynamic Characteristics** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{GS}$ = 0V<br>$V_{DS}$ = 5V<br>f = 1.0MHz | - | 14 | - | pF |
| $C_{OSS}$ | Output Capacitance | | - | 11 | - | |
| $C_{RSS}$ | Reverse Transfer Capacitance | | - | 5 | - | |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time *3 | $V_{DD}$ = 5V, $I_D$ = 10mA<br>$V_{GS}$ = 5V, $R_G$ = 10Ω<br>$R_L$ = 500Ω | - | 15 | - | ns |
| $t_r$ | Turn-on Rise Time *3 | | - | 35 | - | |
| $t_{d(off)}$ | Turn-Off Delay Time *3 | | - | 80 | - | |
| $t_f$ | Turn-Off Fall Time *3 | | - | 80 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage *2 | $I_{SD}$ = 10mA, $V_{GS}$ = 0V | - | 0.7 | 1.2 | V |

Notes:

1. The data tested by surface mounted on a minimum recommended FR-4 board
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. Guaranteed by design, not subject to production

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

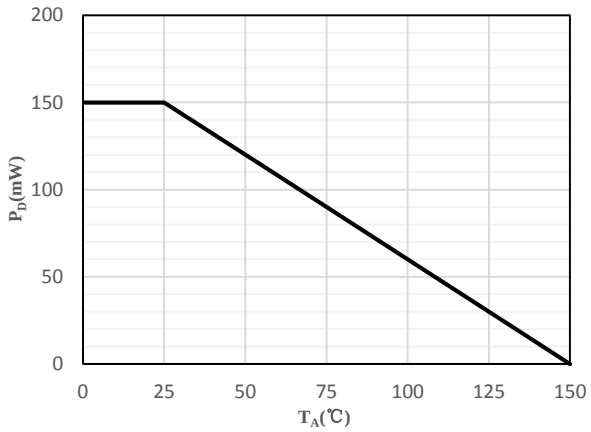



Fig 1 Power Dissipation

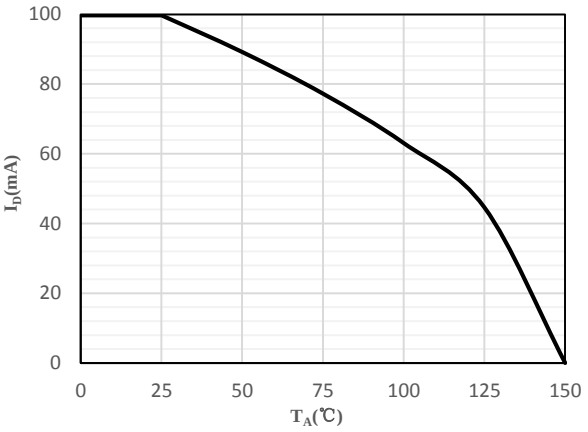



Fig 2 Drain Current

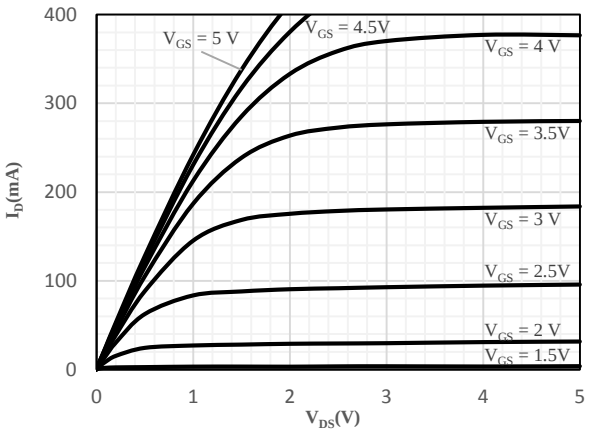



Fig 3 Typical Output Characteristics

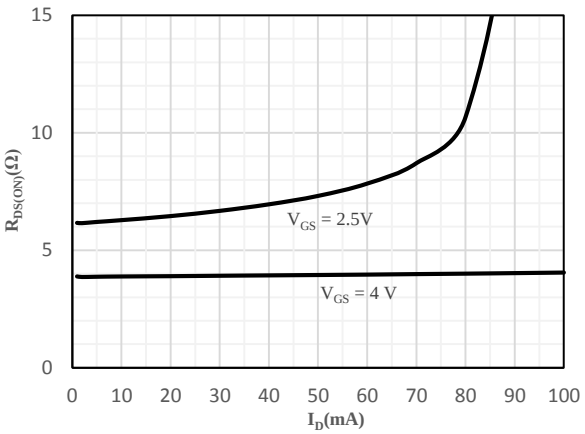



Fig 4 On-Resistance vs. Drain Current and Gate Voltage

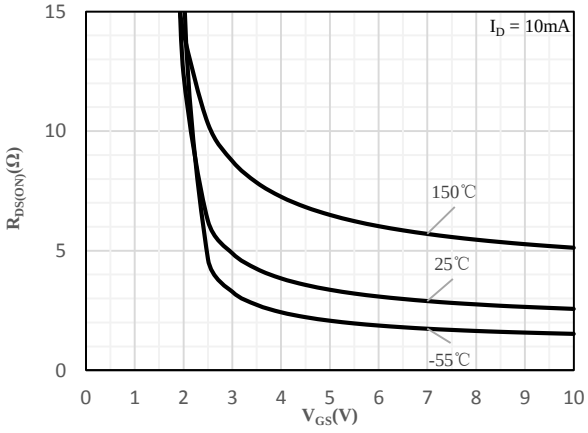



Fig 5 On-Resistance vs. Gate-Source Voltage

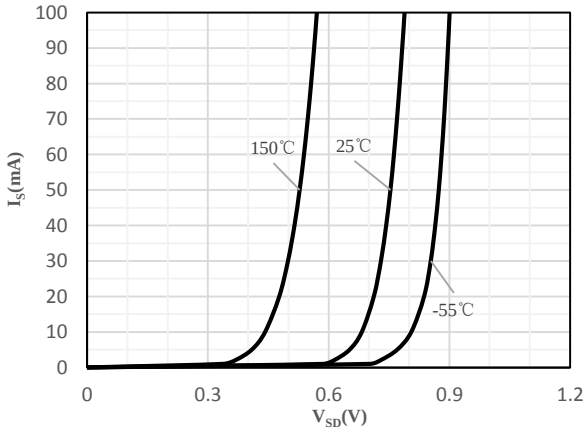



Fig 6 Body-Diode Characteristics

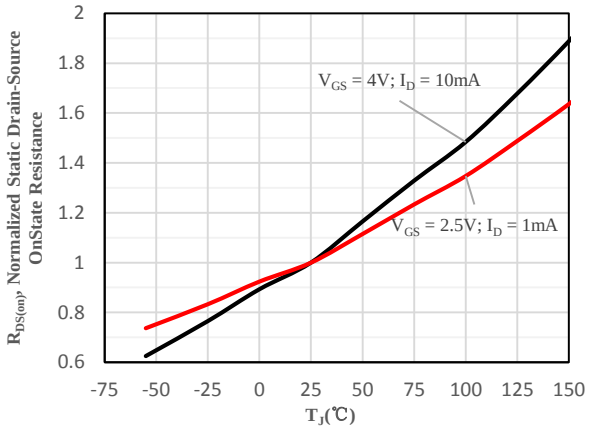



Fig 7 Normalized On-Resistance vs. Junction Temperature

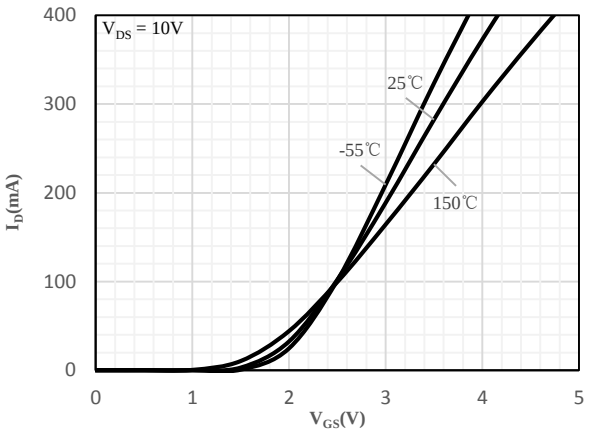



Fig 8 Transfer Characteristics

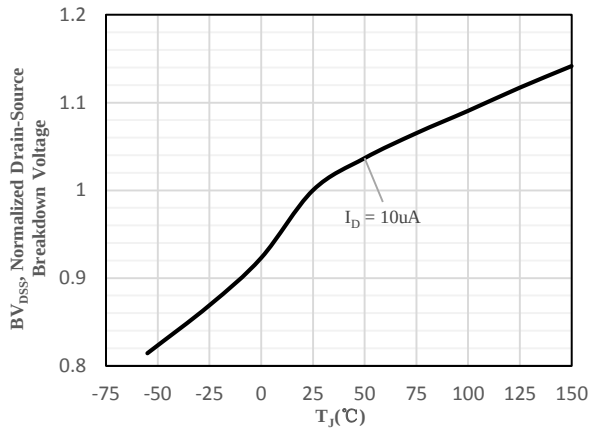



Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

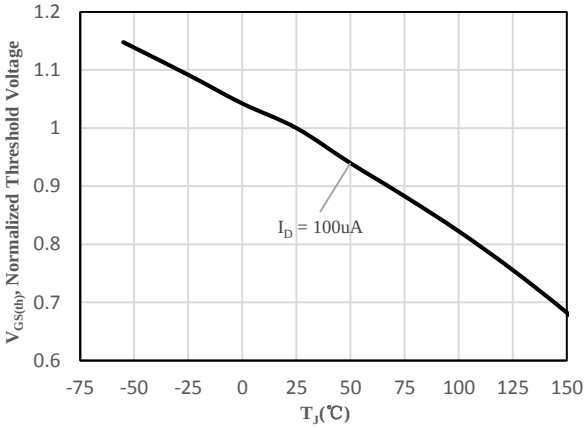



Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

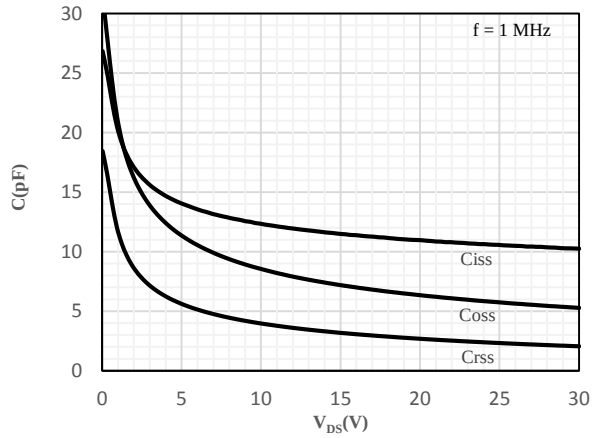



Fig 11 Capacitance Characteristics

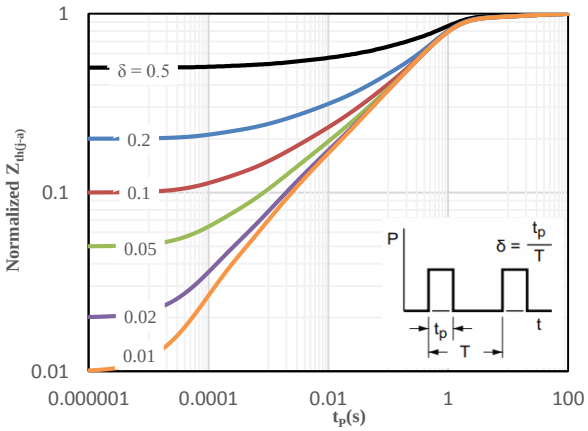
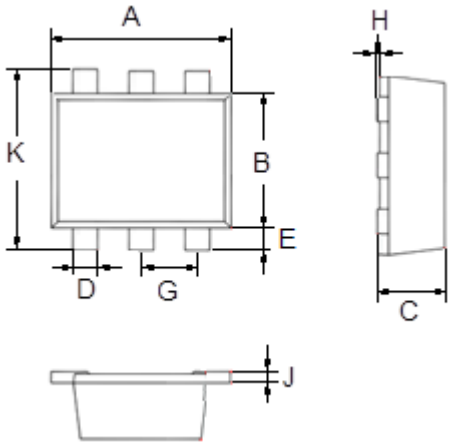



Fig 12 Normalized Maximum transient thermal impedance

## Package Outline Dimensions (Unit: mm)




| SOT-563 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 1.500 | 1.700 |
| B | 1.100 | 1.300 |
| C | 0.525 | 0.600 |
| D | 0.170 | 0.270 |
| E | 0.100 | 0.300 |
| G | 0.450 | 0.550 |
| H | 0.000 | 0.050 |
| J | 0.090 | 0.160 |
| K | 1.500 | 1.700 |

## Mounting Pad Layout (Unit: mm)

### SOT-563