## 1. Description

BLM2303 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

### KEY CHARACTERISTICS

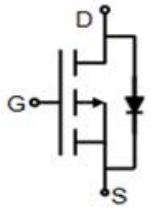
| Parameter | Value | Unit |
|---|---|---|
| $V_{DS}$ | -30 | V |
| $I_D$ | -2 | A |
| $R_{DS(ON)}$@10V.Typ | 65 | mΩ |

### FEATURES

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

### APPLICATIONS

- PWM applications
- Load switch
- Power management





**SOT-23 Top View**

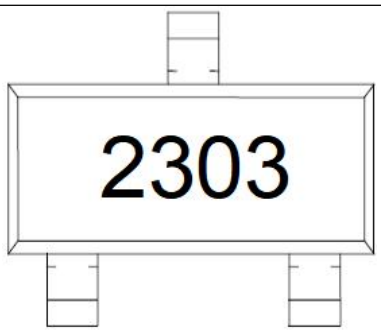
### ORDERING INFORMATION

| Device Marking | Ordering Codes | Package | Product Code | Packing |
|---|---|---|---|---|
| M2303 | BLM2303 | SOT-23 | BLM2303 | Reel |

BLM2303

Chip name

BLM2303:-30V 80mΩ



## 2. ABSOLUTE RATINGS

at $T_C$ = 25°C, unless otherwise specified

| Symbol | Parameter | Ratings | Units |
|---|---|---|---|
| $V_{DSS}$ | Drain-to-Source Voltage | -30 | V |
| $I_D$ | Continuous Drain Current | -2 | A |
| | Continuous Drain Current $T_C$ = 100 °C | -1.3 | A |
| $I_{DM}$ | Pulsed Drain Current(Note1) | -8 | A |
| $P_D$ | Power Dissipation | 0.6 | W |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| $T_J$， $T_{stg}$ | Operating Junction and Storage Temperature Range | 150，–55 to 150 | ℃ |

## 3. Thermal characteristics

| Symbol | Parameter | Ratings | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance,Junction-to-Ambient | 200 | ℃/W |

## 4. Electrical Characteristics

at $T_C$ = 25°C, unless otherwise specified

| OFF Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Values | | | Units |
| | | | Min. | Typ. | Max. | |
| $V_{DSS}$ | Drain to Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | -30 | -- | -- | V |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$ =-30V, $V_{GS}$= 0V | -- | -- | -1 | μA |
| $I_{GSS}$ | Gate to Source Forward Leakage | $V_{GS}$ =±20V | -- | -- | 100 | nA |

| ON Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Values | | | Units |
| | | | Min. | Typ. | Max. | |
| $R_{DS(ON)}$ (Note2) | Drain-to-Source On-Resistance | $V_{GS}$=-10V, $I_D$=-2A | -- | 65 | 80 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-1A | -- | 90 | 120 | mΩ |
| $V_{GS(TH)}$ (Note2) | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA | -1.0 | -1.5 | -2.4 | V |

| Dynamic Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Values | | | Units |
| | | | Min. | Typ. | Max. | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V<br>$V_{DS}$ = -15V<br>f = 1.0MHz | -- | 470 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 42 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 35 | -- | |

| Switching Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Values | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $I_D$ =-2A<br>$V_{DD}$ = -15V<br>$V_{GS}$ = -10V<br>$R_G$ =6Ω | -- | 6 | -- | ns |
| tr | Rise Time | | -- | 8 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 15 | -- | |
| $t_f$ | Fall Time | | -- | 3 | -- | |
| $Q_g$ | Total Gate Charge | $I_D$ =-4A<br>$V_{DD}$ =-20V<br>$V_{GS}$ = -4.5V | -- | 5.7 | -- | nC |
| $Q_{gs}$ | Gate to Source Charge | | -- | 2.3 | -- | |
| $Q_{gd}$ | Gate to Drain (“Miller”)Charge | | -- | 1.8 | -- | |

| Source-Drain Diode Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Values | | | Units |
| | | | Min. | Typ. | Max. | |
| $I_S$ | Continuous Source Current (Body Diode) | $T_C$=25 °C | -- | -- | -2 | A |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=-1A,<br>$V_{GS}$=0V | -- | -- | -1.2 | V |

Note1: Pulse width limited by maximum junction temperature
Note2: Pulse width tp≤300μs, δ≤2%

## 5. Characteristics Curves

**Figure 1 Output Characteristics**

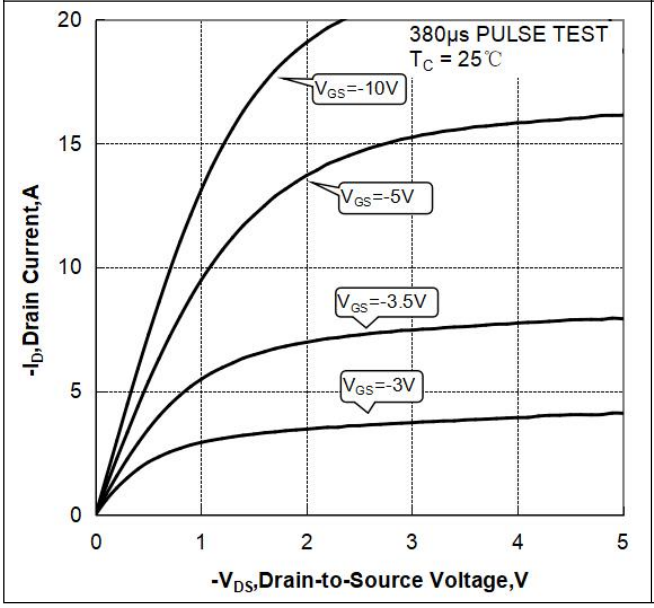



**Figure 2 Transfer Characteristics**

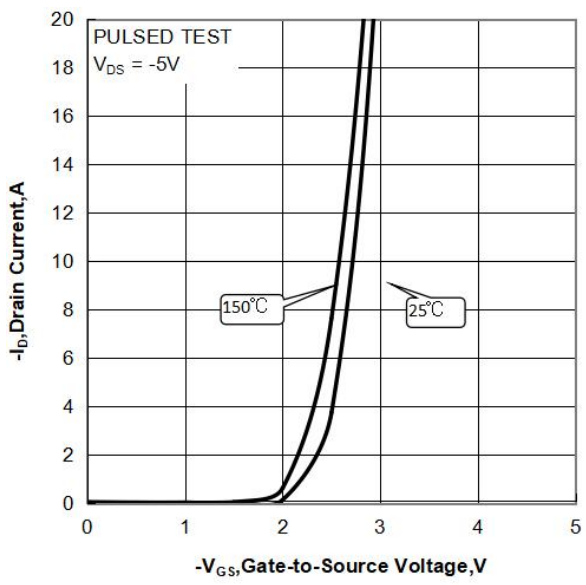



**Figure 3 On-Resistance vs. $I_D$ and $V_{GS}$**

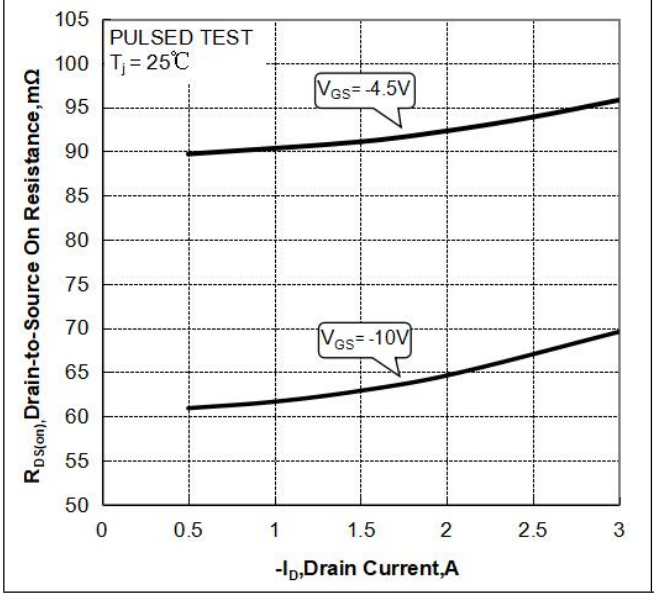



**Figure 4 On-Resistance vs. Junction Temperature**

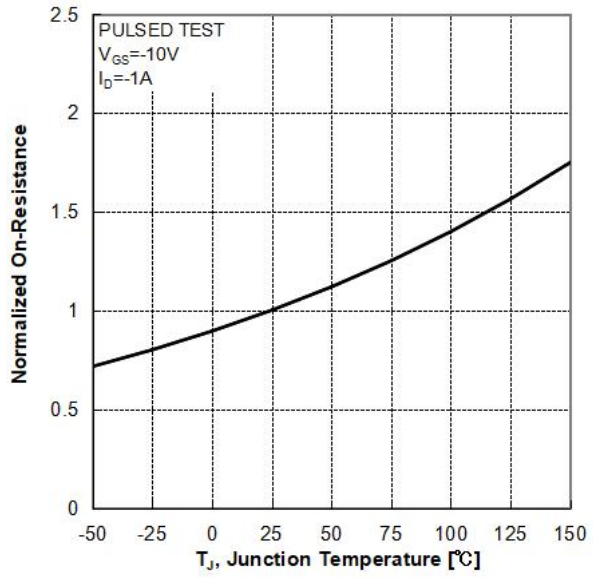


**Figure 5 BV vs Junction Temperature**

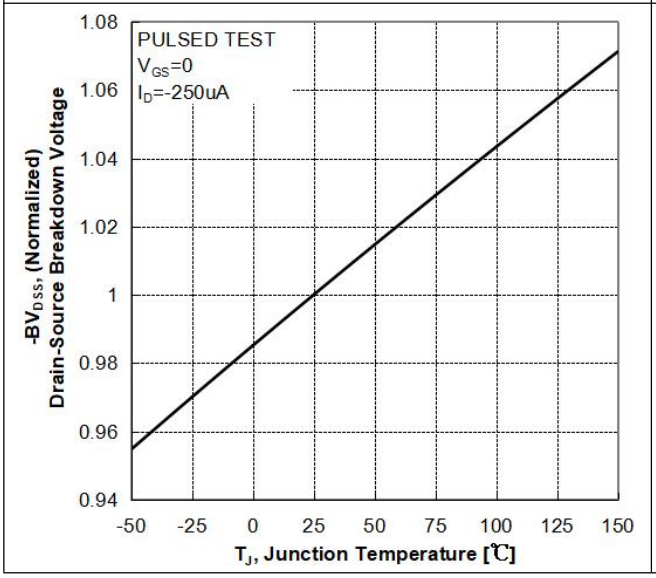



**Figure 6 Vth vs Junction Temperature**

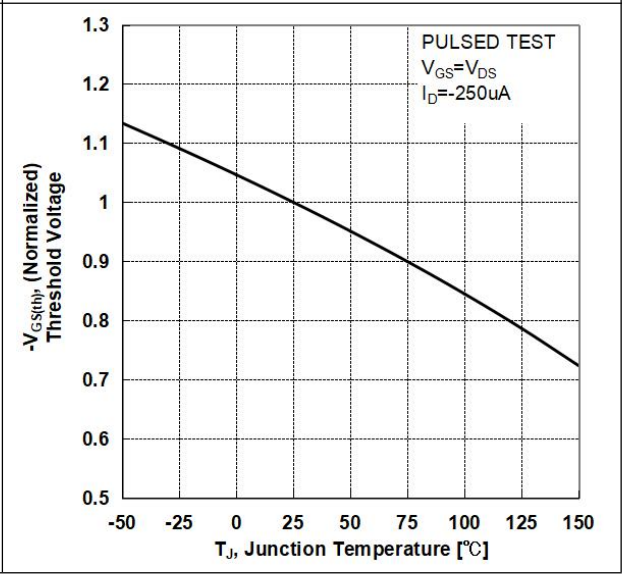



**Figure 7 Gate-Charge Characteristics**

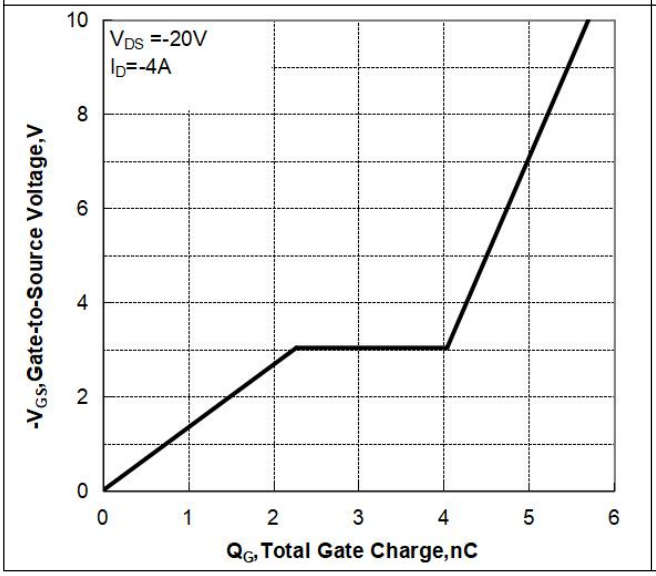



**Figure 8 Capacitance Characteristics**

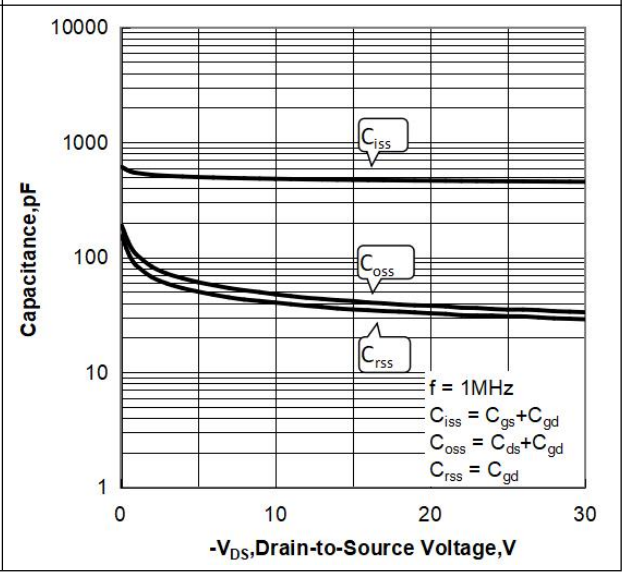


**Figure 9 Body Diode Forward Voltage**

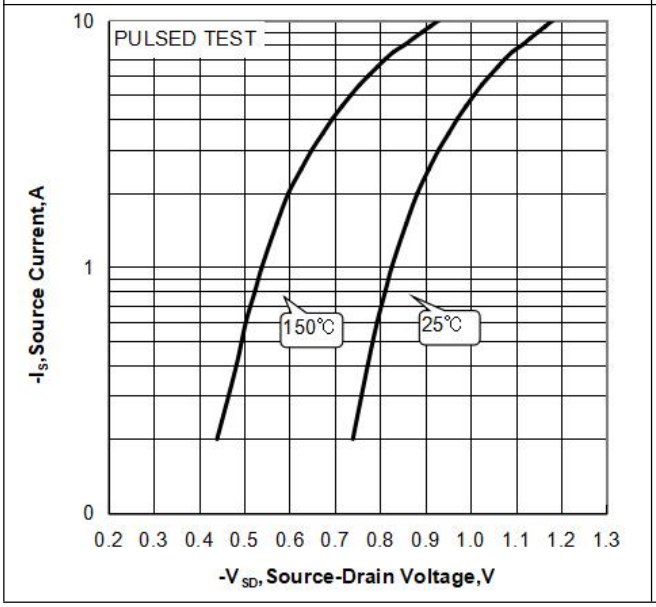



**Figure 10 Maximum Forward Biased Safe Operation Area**

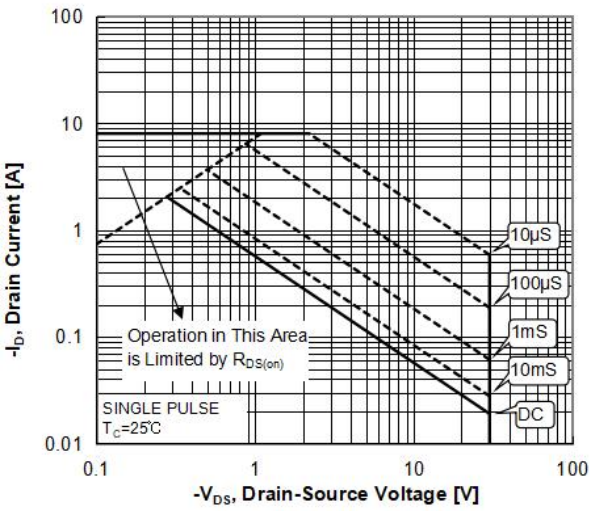
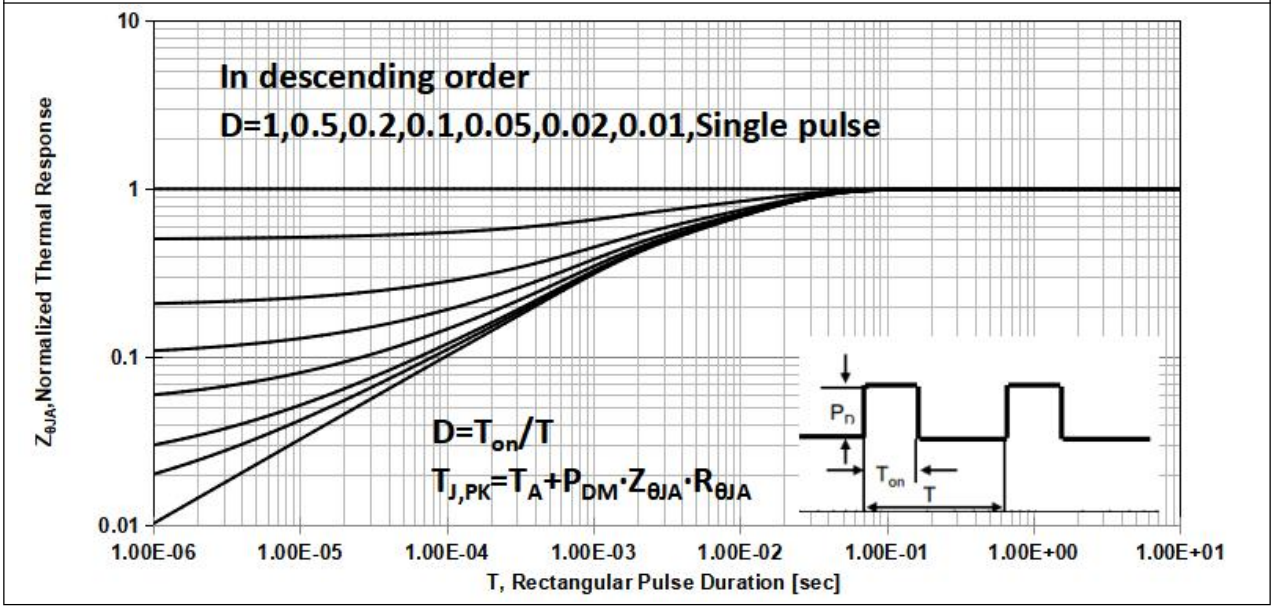
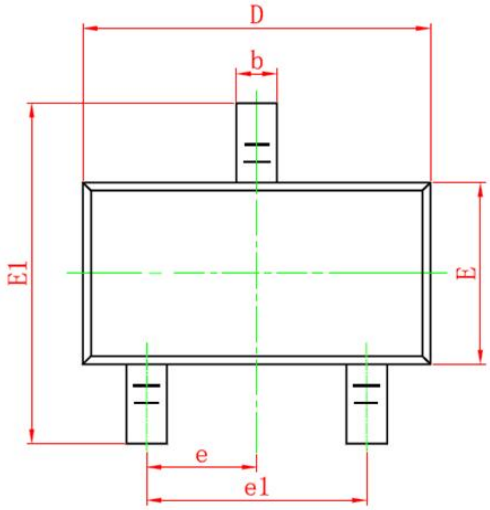
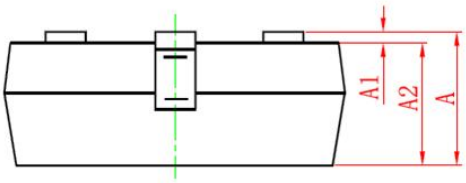


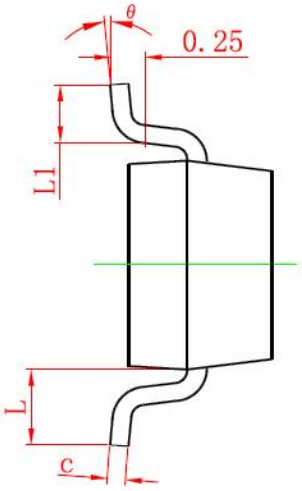

**Figure 11 Normalized Maximum Transient Thermal Impedance**



## 6.Package Description




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

SOT-23 package

**NOTE:**

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shanghai Belling reserves the right to make changes in this specification sheet and is subject to change without prior notice.

## CONTACT:

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