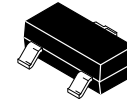


# Switch – N-Channel

## MMBF5103



SOT-23  
CASE 318-08

### Features

- This Device is Designed for Low Level Analog Switching, Sample and Hold Circuits and Chopper Stabilized Amplifiers
- Sourced from Process 51
- See J111 for Characteristics
- This is a Pb-Free and Halide Free Device

### ABSOLUTE MAXIMUM RATINGS

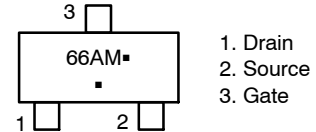
(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Notes 1 and 2)

| Symbol         | Parameter                                        | Value      | Unit             |
|----------------|--------------------------------------------------|------------|------------------|
| $V_{DG}$       | Drain–Gate Voltage                               | 40         | V                |
| $V_{GS}$       | Gate–Source Voltage                              | –40        | V                |
| $I_{GF}$       | Forward Gate Current                             | 50         | mA               |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | –55 to 150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. onsemi should be consulted on applications involving pulsed or low-duty-cycle operations.

### MARKING DIAGRAM



66A = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

### ORDERING INFORMATION

| Device   | Package                           | Shipping              |
|----------|-----------------------------------|-----------------------|
| MMBF5103 | SOT-23<br>(Pb-Free / Halide Free) | 3000 /<br>Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

### THERMAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.) (Note 3)

| Symbol          | Parameter                               | Value | Unit                      |
|-----------------|-----------------------------------------|-------|---------------------------|
| $P_D$           | Total Device Dissipation                | 350   | mW                        |
|                 | Derate Above $25^\circ\text{C}$         | 2.8   | mW/ $^\circ\text{C}$      |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 357   | $^\circ\text{C}/\text{W}$ |

3. Device mounted on FR-4 PCB 36 mm × 18 mm × 1.5 mm; mounting pad for the collector lead minimum 6 cm<sup>2</sup>.

### ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

| Symbol | Parameter | Test Conditions | Min | Max | Unit |
|--------|-----------|-----------------|-----|-----|------|
|--------|-----------|-----------------|-----|-----|------|

#### OFF CHARACTERISTICS

|               |                               |                                                               |      |      |    |
|---------------|-------------------------------|---------------------------------------------------------------|------|------|----|
| $V_{(BR)GSS}$ | Gate–Source Breakdown Voltage | $I_G = 1.0 \mu\text{A}, V_{DS} = 0$                           | –40  | –    | V  |
| $I_{GSS}$     | Gate Reverse Current          | $V_{GS} = -15 \text{ V}, V_{DS} = 0$                          | –    | –200 | pA |
|               |                               | $V_{GS} = -15 \text{ V}, V_{DS} = 0, T_A = 125^\circ\text{C}$ | –    | –500 | nA |
| $V_{GS(off)}$ | Gate–Source Cut–Off Voltage   | $V_{DS} = 20 \text{ V}, I_D = 1.0 \text{ nA}$                 | –1.2 | –2.7 | V  |
| $V_{GS(f)}$   | Gate–Source Forward Voltage   | $I_G = 1.0 \text{ mA}, V_{DS} = 0$                            | –    | 1.0  | V  |

#### ON CHARACTERISTICS

|           |                                          |                                     |    |    |    |
|-----------|------------------------------------------|-------------------------------------|----|----|----|
| $I_{DSS}$ | Zero–Gate Voltage Drain Current (Note 4) | $V_{DS} = 15 \text{ V}, V_{GS} = 0$ | 10 | 40 | mA |
|-----------|------------------------------------------|-------------------------------------|----|----|----|

#### SMALL SIGNAL CHARACTERISTICS

|           |                              |                                                          |   |     |    |
|-----------|------------------------------|----------------------------------------------------------|---|-----|----|
| $C_{iss}$ | Input Capacitance            | $V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz}$ | – | 16  | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | $V_{GS} = -15 \text{ V}, f = 1.0 \text{ MHz}$            | – | 6.0 | pF |

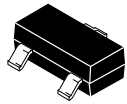
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Pulse test with  $PW = 300 \mu\text{s}$ , 1% duty cycle.

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®

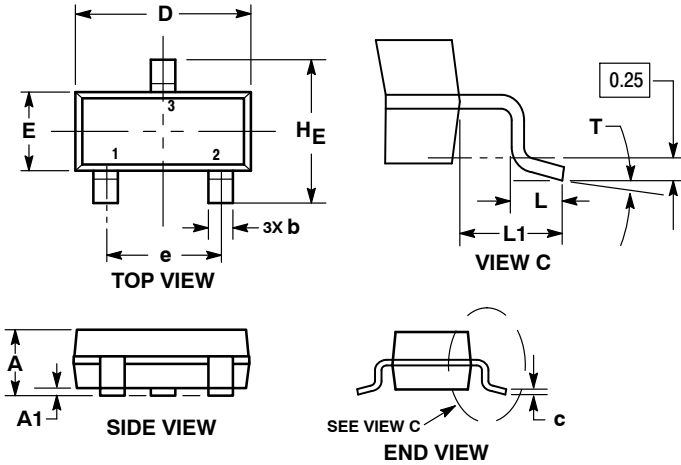
ON



## SOT-23 (TO-236) CASE 318-08 ISSUE AS

DATE 30 JAN 2018

SCALE 4:1

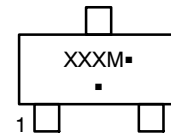


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 0.89        | 1.00 | 1.11 | 0.035  | 0.039 | 0.044 |
| A1  | 0.01        | 0.06 | 0.10 | 0.000  | 0.002 | 0.004 |
| b   | 0.37        | 0.44 | 0.50 | 0.015  | 0.017 | 0.020 |
| c   | 0.08        | 0.14 | 0.20 | 0.003  | 0.006 | 0.008 |
| D   | 2.80        | 2.90 | 3.04 | 0.110  | 0.114 | 0.120 |
| E   | 1.20        | 1.30 | 1.40 | 0.047  | 0.051 | 0.055 |
| e   | 1.78        | 1.90 | 2.04 | 0.070  | 0.075 | 0.080 |
| L   | 0.30        | 0.43 | 0.55 | 0.012  | 0.017 | 0.022 |
| L1  | 0.35        | 0.54 | 0.69 | 0.014  | 0.021 | 0.027 |
| HE  | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |
| T   | 0°          | ---  | 10°  | 0°     | ---   | 10°   |

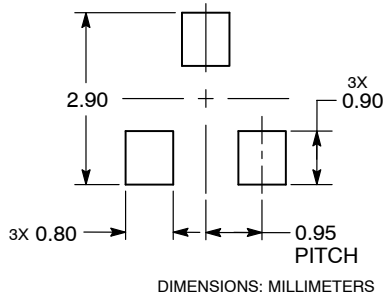
### GENERIC MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

### RECOMMENDED SOLDERING FOOTPRINT



DIMENSIONS: MILLIMETERS

STYLE 1 THRU 5:  
CANCELLED

STYLE 6:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

STYLE 7:  
PIN 1. EMITTER  
2. BASE  
3. COLLECTOR

STYLE 8:  
PIN 1. ANODE  
2. NO CONNECTION  
3. CATHODE

STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 10:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE

STYLE 11:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE

STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 13:  
PIN 1. SOURCE  
2. DRAIN  
3. GATE

STYLE 14:  
PIN 1. CATHODE  
2. GATE  
3. ANODE

STYLE 15:  
PIN 1. GATE  
2. CATHODE  
3. ANODE

STYLE 16:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE

STYLE 17:  
PIN 1. NO CONNECTION  
2. ANODE  
3. CATHODE

STYLE 18:  
PIN 1. NO CONNECTION  
2. CATHODE  
3. ANODE

STYLE 19:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE-ANODE

STYLE 20:  
PIN 1. CATHODE  
2. ANODE  
3. GATE

STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

STYLE 22:  
PIN 1. RETURN  
2. OUTPUT  
3. INPUT

STYLE 23:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 24:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE

STYLE 25:  
PIN 1. ANODE  
2. CATHODE  
3. GATE

STYLE 26:  
PIN 1. CATHODE  
2. ANODE  
3. NO CONNECTION

STYLE 27:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE

STYLE 28:  
PIN 1. ANODE  
2. ANODE  
3. ANODE

|                  |                 |                                                                                                                                                                                  |
|------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SOT-23 (TO-236) | PAGE 1 OF 1                                                                                                                                                                      |

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