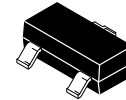


# Switch – N-Channel

## 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

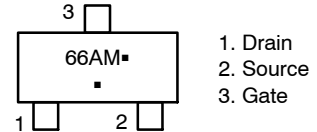
(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Notes 1 and 2)

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 (Pb-Free / Halide Free)	3000 / 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	$\text{mW}/^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction–to–Ambient	357	$^\circ\text{C}/\text{W}$

3. Device mounted on FR-4 PCB  $36\text{ mm} \times 18\text{ mm} \times 1.5\text{ mm}$ ; mounting pad for the collector lead minimum  $6\text{ cm}^2$ .

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

Symbol	Parameter	Test Conditions	Min	Max	Unit
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#### 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
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#### 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

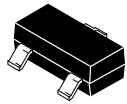
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

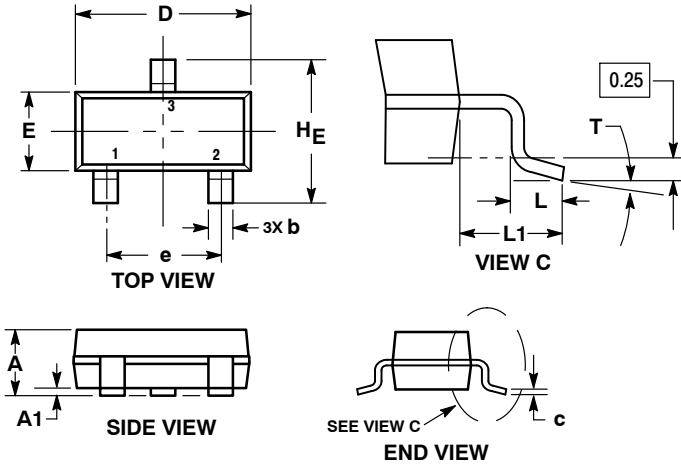
ON Semiconductor®



**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°

**RECOMMENDED SOLDERING FOOTPRINT**



**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.

- |   |   |   |  |
|---|---|---|--|
| STYLE 1 THRU 5:<br>CANCELLED                                | STYLE 6:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR       | STYLE 7:<br>PIN 1. EMITTER<br>2. BASE<br>3. COLLECTOR       | STYLE 8:<br>PIN 1. ANODE<br>2. NO CONNECTION<br>3. CATHODE |
| STYLE 9:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE          | STYLE 10:<br>PIN 1. DRAIN<br>2. SOURCE<br>3. GATE           | STYLE 11:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE-ANODE | STYLE 12:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE      |
| STYLE 13:<br>PIN 1. SOURCE<br>2. DRAIN<br>3. GATE           | STYLE 14:<br>PIN 1. CATHODE<br>2. GATE<br>3. ANODE          | STYLE 15:<br>PIN 1. GATE<br>2. CATHODE<br>3. ANODE          | STYLE 16:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE      |
| STYLE 17:<br>PIN 1. NO CONNECTION<br>2. ANODE<br>3. CATHODE | STYLE 18:<br>PIN 1. NO CONNECTION<br>2. CATHODE<br>3. ANODE | STYLE 19:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE-ANODE | STYLE 20:<br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE         |
| STYLE 21:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN           | STYLE 22:<br>PIN 1. RETURN<br>2. OUTPUT<br>3. INPUT         | STYLE 23:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE         | STYLE 24:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE          |
| STYLE 25:<br>PIN 1. ANODE<br>2. CATHODE<br>3. GATE          | STYLE 26:<br>PIN 1. CATHODE<br>2. ANODE<br>3. NO CONNECTION | STYLE 27:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE     | STYLE 28:<br>PIN 1. ANODE<br>2. ANODE<br>3. ANODE          |

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<b>DESCRIPTION:</b>	<b>SOT-23 (TO-236)</b>	<b>PAGE 1 OF 1</b>

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