

# P-Channel Switch

## MMBFJ270

### Description

This device is designed for low level analog switching sample and hold circuits and chopper stabilized amplifiers.

Sourced from process 88.

### Features

- These are Pb-Free Devices

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 1)

Symbol	Parameter	Value	Unit
$V_{DG}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	30	V
$I_{GF}$	Forward Gate Current	50	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$

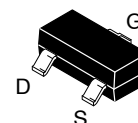
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- These ratings are limiting values above which the serviceability of any semiconductor device may be impaired. These are steady-state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

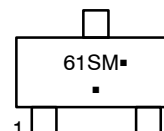
Symbol	Parameter	Max	Unit
$P_D$	Total Device Dissipation	225	mW
	Derate Above $25^\circ\text{C}$	1.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 2)	556	$^\circ\text{C}/\text{W}$

- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.



SOT-23 (TO-236)  
CASE 318-08

### MARKING DIAGRAMS



61S = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package  
(Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping†
MMBFJ270	SOT-23 (TO-236) (Pb-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](#).

# MMBFJ270

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Max	Unit
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### OFF CHARACTERISTICS (Note 3)

V <sub>(BR)GSS</sub>	Gate–Source Breakdown Voltage	I <sub>G</sub> = 1.0 μA, V <sub>DS</sub> = 0	30		V
I <sub>GSS</sub>	Gate Reverse Current	V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0		200	pA
V <sub>GS(off)</sub>	Gate–Source Cut–Off Voltage	V <sub>DS</sub> = –15 V, I <sub>D</sub> = –1.0 nA	0.5	2.0	V

### ON CHARACTERISTICS (Note 3)

I <sub>DSS</sub>	Zero–Gate Voltage Drain Current	V <sub>DS</sub> = –15 V, V <sub>GS</sub> = 0	–2.0	–15	mA
g <sub>fs</sub>	Forward Transconductance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 15 V, f = 1.0 kHz	6000	15000	μmhos
g <sub>oss</sub>	Common–Source Output Conductance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 15 V, f = 1.0 kHz		200	μmhos

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.

3. Short duration test pulse used to minimize self–heating effect.

## TYPICAL CHARACTERISTICS

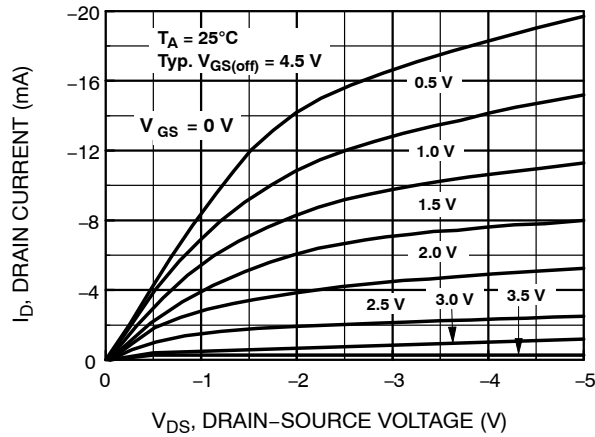


Figure 1. Common Drain-Source

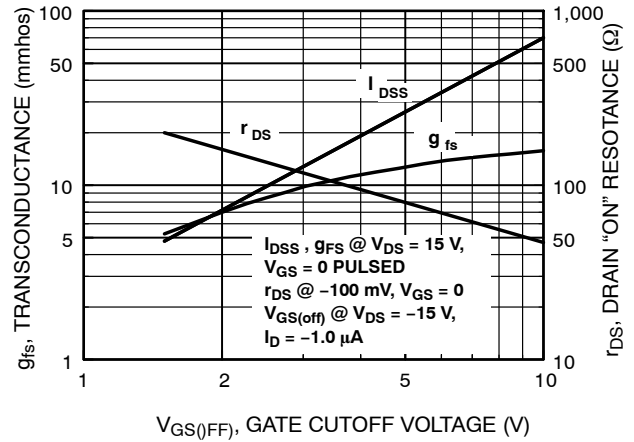


Figure 2. Parameter Interactions

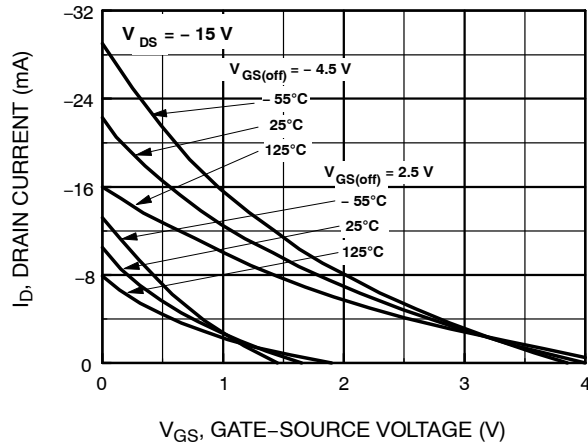


Figure 3. Transfer Characteristics

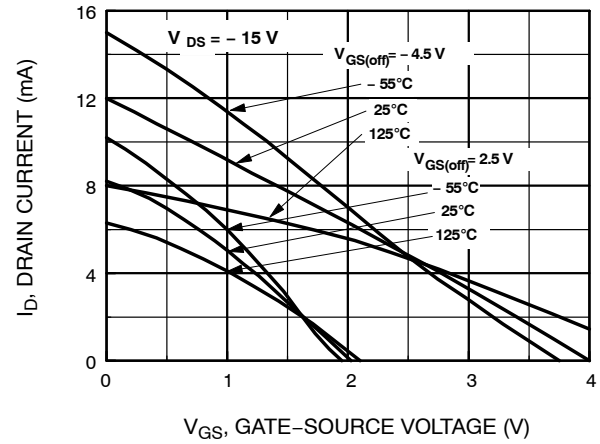


Figure 4. Transfer Characteristics

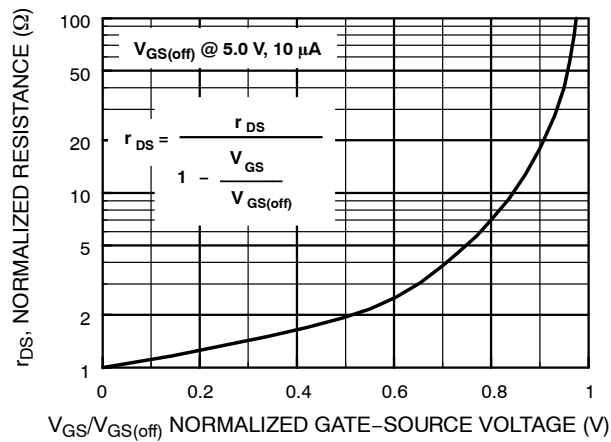


Figure 5. Normalized Drain Resistance vs. Bias Voltage

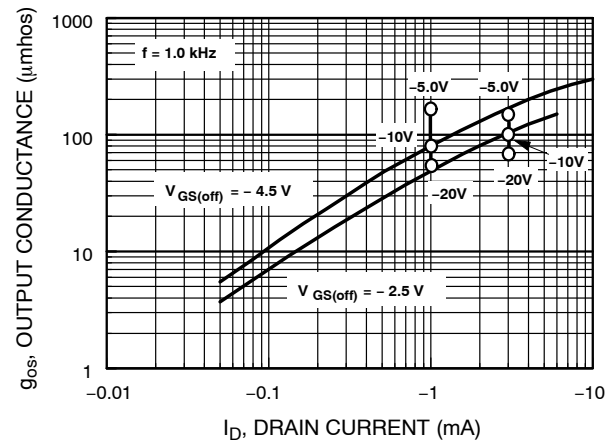


Figure 6. Output Conductance vs. Drain Current

## TYPICAL CHARACTERISTICS (Continued)

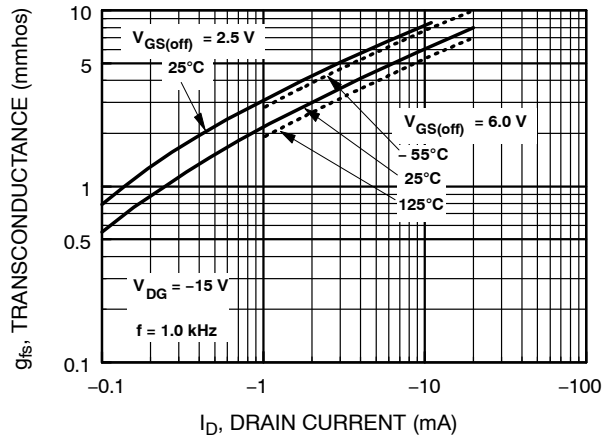


Figure 7. Transconductance vs. Drain Current

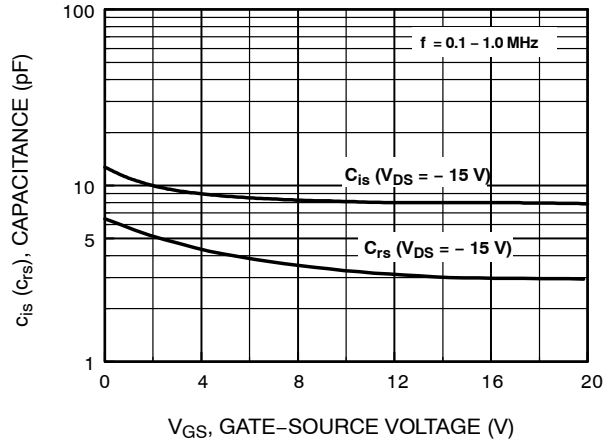


Figure 8. Capacitance vs. Voltage

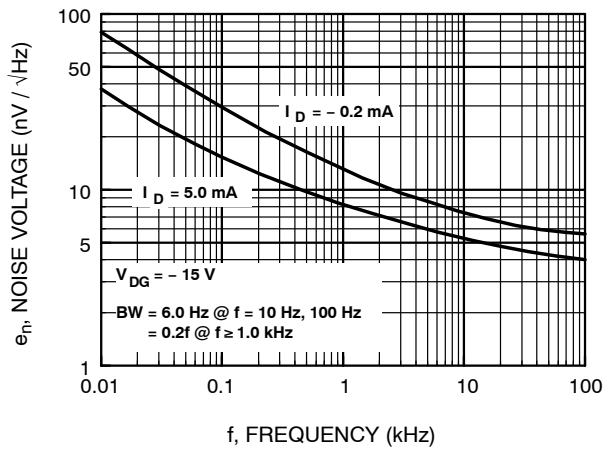


Figure 9. Noise Voltage vs. Frequency

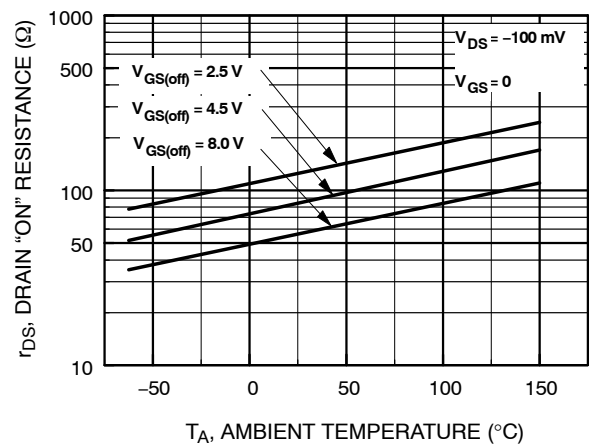


Figure 10. Channel Resistance vs. Temperature

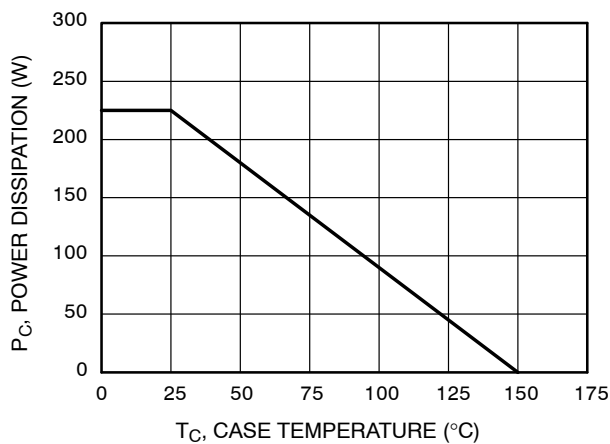
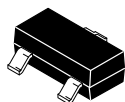


Figure 11. Power Derating

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



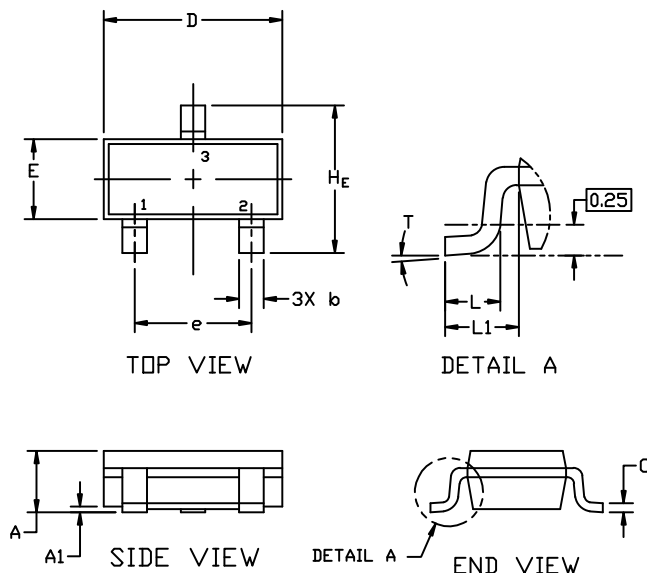
SCALE 4:1

## SOT-23 (TO-236)

CASE 318

ISSUE AT

DATE 01 MAR 2023

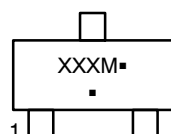


### NOTES:

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.

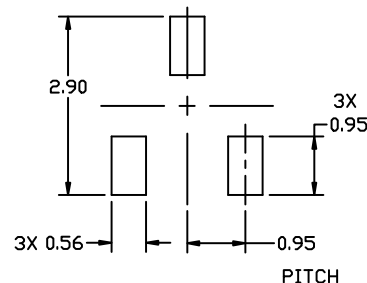
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
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
H <sub>E</sub>	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. Some products may not follow the Generic Marking.



### RECOMMENDED MOUNTING FOOTPRINT

\* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## STYLES ON PAGE 2

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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS



### SOT-23 (TO-236) CASE 318 ISSUE AT

DATE 01 MAR 2023

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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