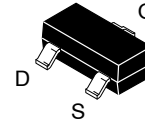


# N-Channel General Purpose Amplifier

## MMBF5457

This device is a low level audio amplifier and switching transistors, and can be used for analog switching applications. Sourced from Process 55.



NOTE: Source & Drain are interchangeable

**SOT-23**  
**CASE 318-08**

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

Symbol	Rating	Value	Unit
$V_{DG}$	Drain- Gate Voltage	25	V
$V_{GS}$	Gate- Source Voltage	-25	V
$I_{GF}$	Forward Gate Current	10	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 rating are limiting values above which the serviceability of any semiconductor device may be impaired.

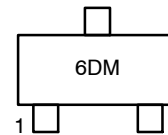
1. These rating are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

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

Symbol	Characteristic	Max	Unit
		*MMBF5457	
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	350 2.8	mW mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	—	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	556	$^\circ\text{C}/\text{W}$

\*Device mounted on FR-4 PCB 1.6" x 1.6" x 0.06".

### MARKING DIAGRAM



6D = Device Code  
M = Date Code

### ORDERING INFORMATION

Device	Package	Shipping†
MMBF5457	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](http://BRD8011/D).

# MMBF5457

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

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = 10\ \mu\text{A}$ , $V_{DS} = 0$	-25	-	-	V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -15\ \text{V}$ , $V_{DS} = 0$ $V_{GS} = -15\ \text{V}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$	-	-	-1.0 -200	nA nA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 15\ \text{V}$ , $I_D = 10\ \text{nA}$	-0.5	-	-6.0	V
$V_{GS}$	Gate-Source Voltage	$V_{DS} = 15\ \text{V}$ , $I_D = 100\ \mu\text{A}$	-	-2.5	-	V

### ON CHARACTERISTICS

$I_{DSS}$	Zero-Gate Voltage Drain Current (Note 3)	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$	1.0	3.0	5.0	mA
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### SMALL SIGNAL CHARACTERISTICS

$g_{fs}$	Forward Transfer Conductance (Note 3)	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$	1000	-	5000	$\mu\text{mhos}$
$g_{os}$	Output Conductance (Note 3)	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$	-	10	50	$\mu\text{mhos}$
$C_{iss}$	Input Capacitance	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$ , $f = 1.0\ \text{MHz}$	-	4.5	7.0	pF
$C_{rss}$	Reverse Transfer Capacitance	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$ , $f = 1.0\ \text{MHz}$	-	1.5	3.0	pF
NF	Noise Figure	$V_{DS} = 15\ \text{V}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$ , $R_G = 1.0\ \text{M}\Omega$ , $BW = 1.0\ \text{Hz}$	-	-	3.0	dB

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. Pulse Test: Pulse Width  $\leq 300\ \text{ms}$ , Duty Cycle  $\leq 2\%$ .

## TYPICAL CHARACTERISTICS

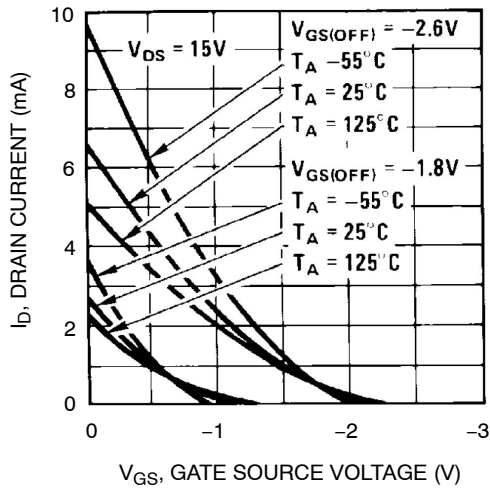


Figure 1. Transfer Characteristics

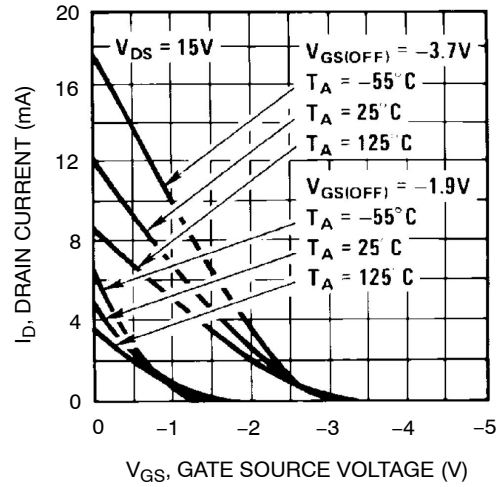


Figure 2. Transfer Characteristics

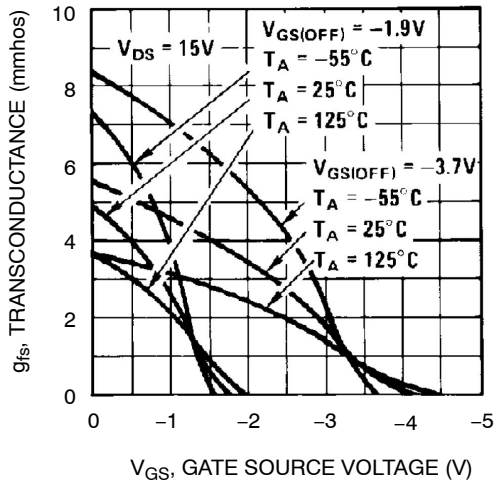


Figure 3. Transfer Characteristics

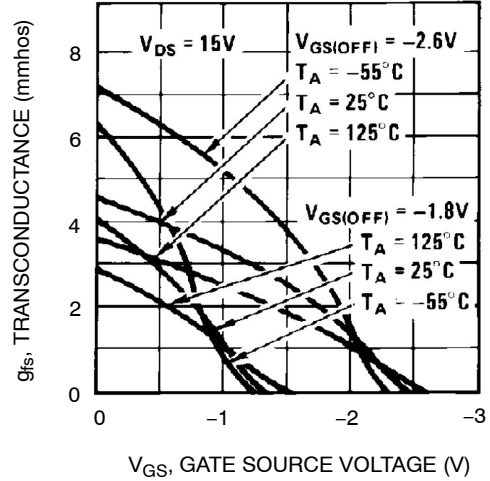


Figure 4. Transfer Characteristics

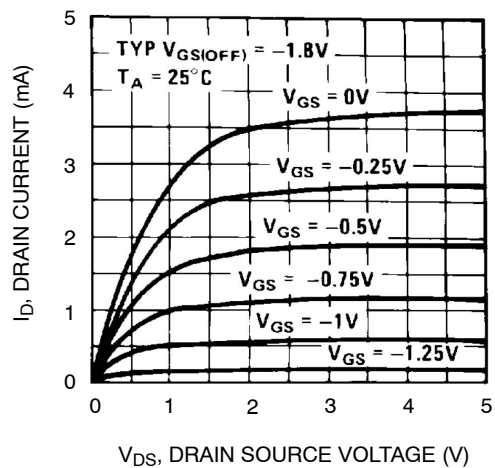


Figure 5. Common Drain-Source

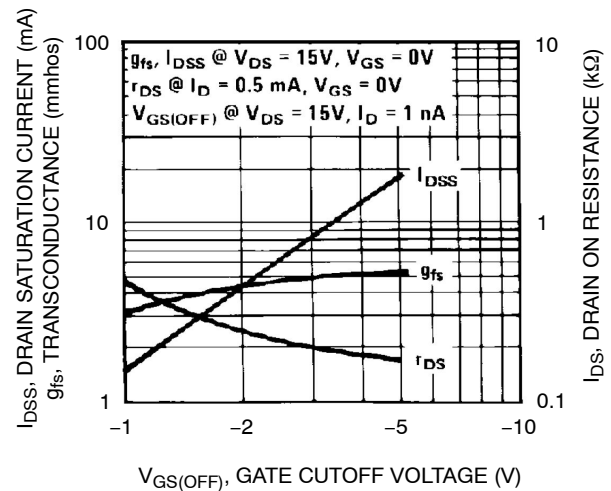


Figure 6. Parameter Interaction

## TYPICAL CHARACTERISTICS (CONTINUED)

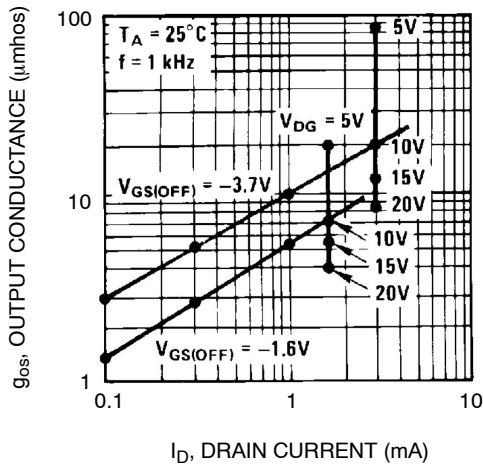


Figure 7. Output Conductance vs. Drain Current

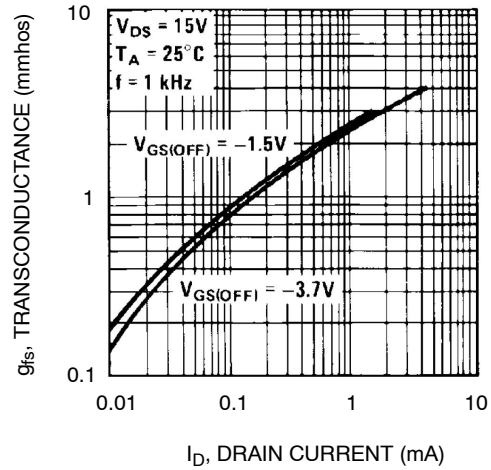


Figure 8. Transconductance vs. Drain Current

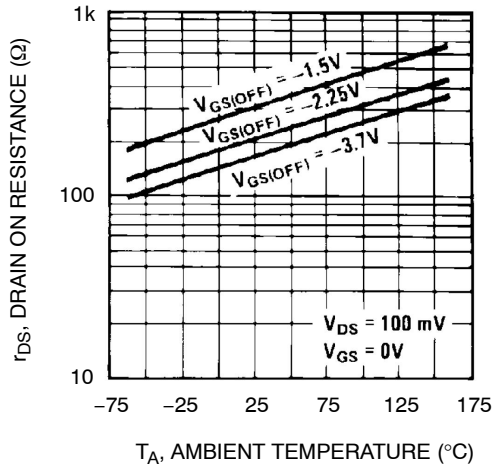


Figure 9. Channel Resistance vs. Temperature

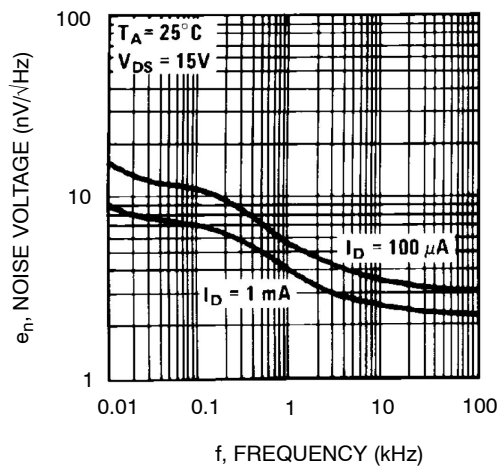


Figure 10. Noise Voltage vs. Frequency

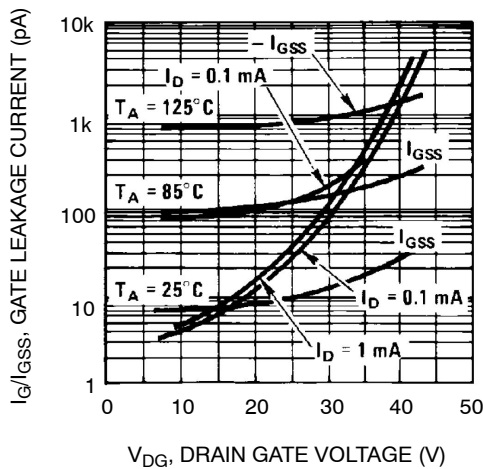


Figure 11. Leakage Current vs. Voltage

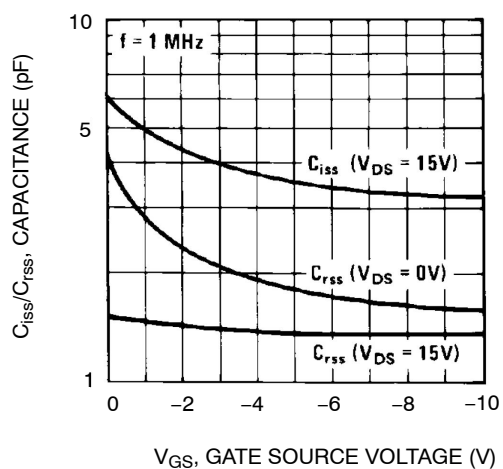


Figure 12. Capacitance vs. Voltage

TYPICAL CHARACTERISTICS (CONTINUED)

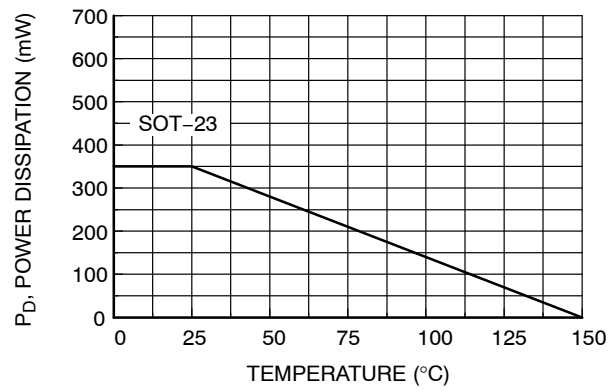


Figure 13. Power Dissipation vs. Ambient Temperature



SCALE 4:1

**SOT-23 (TO-236) 2.90x1.30x1.00 1.90P**  
CASE 318  
ISSUE AU

DATE 14 AUG 2024



MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
HE	2.10	2.40	2.64
T	0°	---	10°

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: 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.

**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 onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**STYLES ON PAGE 2**

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**SOT-23 (TO-236) 2.90x1.30x1.00 1.90P**  
**CASE 318**  
**ISSUE AU**

DATE 14 AUG 2024

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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