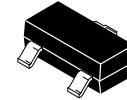


RF Amplifiers, N-Channel

MMBF4416


SOT-23
CASE 318-08
Features

- This Device is Designed for RF Amplifiers
- Sourced from Process 50
- This is a Pb-Free and Halide Free Device

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

Symbol	Parameter	Value	Unit
V_{DG}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	-30	V
I_{GF}	Forward Gate Current	10	mA
T_J, T_{STG}	Junction and Storage 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.

THERMAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ unless otherwise noted.) (Note 1)

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

1. Device mounted on FR-4 PCB $1.6'' \times 1.6'' \times 0.06''$.

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

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

OFF CHARACTERISTICS

$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$V_{DS} = 0, I_G = 1 \mu\text{A}$	-30	-	-	V
I_{GSS}	Gate Reverse Current	$V_{GS} = -20 \text{ V}, V_{DS} = 0$ $V_{GS} = -20 \text{ V}, V_{DS} = 0, T_A = 150^\circ\text{C}$	-	-	-1 -200	nA nA
$V_{GS(off)}$	Gate Source Cut-off Voltage	$V_{DS} = 15 \text{ V}, I_D = 1 \text{ nA}$	-2.5	-	-6	V
V_{GS}	Gate Source Voltage	$V_{DS} = 15 \text{ V}, I_D = 0.5 \text{ mA}$	-1	-	-5.5	V

ON CHARACTERISTICS

I_{DSS}	Zero-Gate Voltage Drain Current	$V_{GS} = 15 \text{ V}, V_{GS} = 0$	5	-	15	mA
$V_{GS(f)}$	Gate-Source Forward Voltage	$V_{DS} = 0, I_G = 1 \text{ mA}$	-	-	1	V

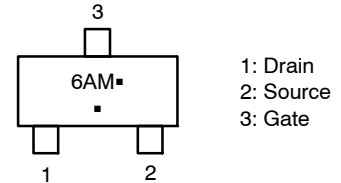
SMALL SIGNAL CHARACTERISTICS

$ Y_{fs} $	Forward Transfer Admittance	$V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1 \text{ kHz}$	4500	-	7500	μmhos
$ y_{os} $	Output Admittance	$V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1 \text{ kHz}$	-	-	50	μmhos
C_{iss}	Input Capacitance	$V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	-	-	4	pF
C_{rss}	Reverse Transfer Capacitance	$V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	-	-	0.9	pF
C_{oss}	Output Capacitance	$V_{DS} = 15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	-	-	2	pF

FUNCTIONAL CHARACTERISTICS

NF	Noise Figure	$V_{DS} = 15 \text{ V}, I_D = 5 \text{ mA}, R_g = 100 \Omega, f = 100 \text{ MHz}$	-	-	2	dB
G_{ps}	Common Source Power Gain	$V_{DS} = 15 \text{ V}, I_D = 5 \text{ mA}, R_g = 100 \Omega, f = 100 \text{ MHz}$	18	-	-	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.

MARKING DIAGRAM


6A = Specific Device Code
M = Date Code
■ = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping [†]
MMBF4416	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](#).

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



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

DATE 01 MAR 2023

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
H _E	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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