

MMBFJ309LT1, MMBFJ310LT1

JFET - VHF/UHF Amplifier Transistor

N-Channel



ON Semiconductor®

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Features

- Pb-Free Packages are Available

MAXIMUM RATINGS

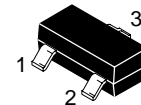
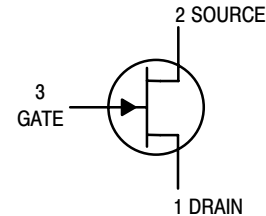
Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	25	Vdc
Gate-Source Voltage	V_{GS}	25	Vdc
Gate Current	I_G	10	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

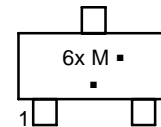
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR-5 = 1.0 x 0.75 x 0.062 in.



SOT-23 (TO-236)
CASE 318
STYLE 10

MARKING DIAGRAM



6x = Device Code
x = U for MMBFJ309LT1
x = T for MMBFJ310LT1

M = Date Code*
■ = Pb-Free Package

(Note: Microdot may be in either location)
*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
MMBFJ309LT1	SOT-23	3,000 / Tape & Reel
MMBFJ309LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
MMBFJ310LT1	SOT-23	3,000 / Tape & Reel
MMBFJ310LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Gate–Source Breakdown Voltage ($I_G = -1.0 \mu\text{A}$, $V_{DS} = 0$)	$V_{(BR)GSS}$	-25	-	-	Vdc
Gate Reverse Current ($V_{GS} = -15 \text{ Vdc}$) ($V_{GS} = -15 \text{ Vdc}$, $T_A = 125^\circ\text{C}$)	I_{GSS}	-	-	-1.0 -1.0	nA μA
Gate Source Cutoff Voltage ($V_{DS} = 10 \text{ Vdc}$, $I_D = 1.0 \text{ nA}$)	MMBFJ309 MMBFJ310 $V_{GS(off)}$	-1.0 -2.0	- -	-4.0 -6.5	Vdc
ON CHARACTERISTICS					
Zero–Gate–Voltage Drain Current ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$)	MMBFJ309 MMBFJ310 I_{DSS}	12 24	- -	30 60	mA
Gate–Source Forward Voltage ($I_G = 1.0 \text{ mA}$, $V_{DS} = 0$)	$V_{GS(f)}$	-	-	1.0	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Forward Transfer Admittance ($V_{DS} = 10 \text{ Vdc}$, $I_D = 10 \text{ mA}$, $f = 1.0 \text{ kHz}$)	$ Y_{fs} $	8.0	-	18	mmhos
Output Admittance ($V_{DS} = 10 \text{ Vdc}$, $I_D = 10 \text{ mA}$, $f = 1.0 \text{ kHz}$)	$ y_{os} $	-	-	250	μmhos
Input Capacitance ($V_{GS} = -10 \text{ Vdc}$, $V_{DS} = 0 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	C_{iss}	-	-	5.0	pF
Reverse Transfer Capacitance ($V_{GS} = -10 \text{ Vdc}$, $V_{DS} = 0 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	C_{rss}	-	-	2.5	pF
Equivalent Short–Circuit Input Noise Voltage ($V_{DS} = 10 \text{ Vdc}$, $I_D = 10 \text{ mA}$, $f = 100 \text{ Hz}$)	\bar{e}_n	-	10	-	$\text{nV}/\sqrt{\text{Hz}}$

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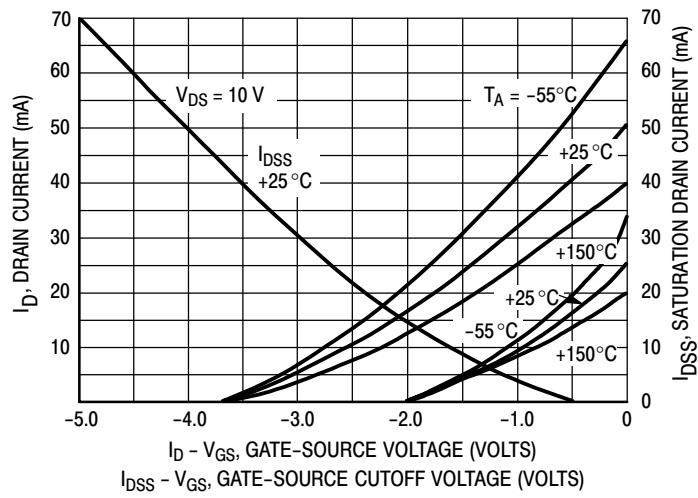


Figure 1. Drain Current and Transfer Characteristics versus Gate-Source Voltage

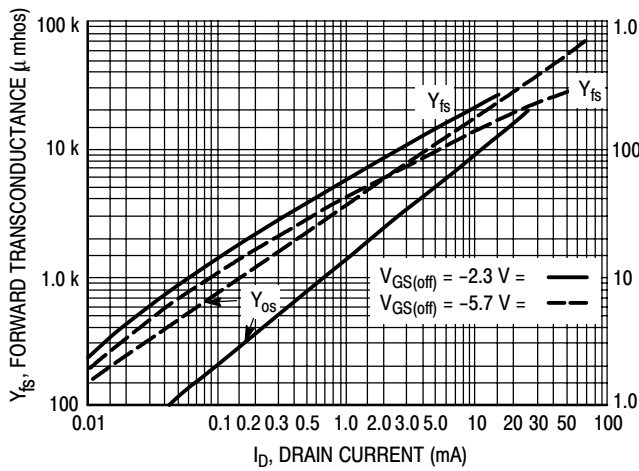


Figure 2. Common-Source Output Admittance and Forward Transconductance versus Drain Current

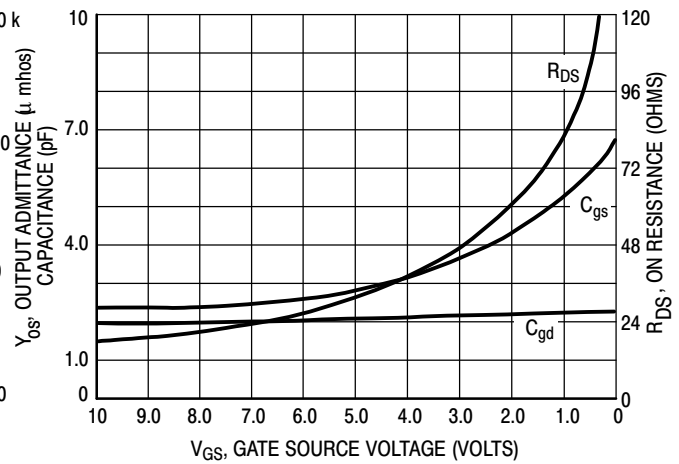


Figure 3. On Resistance and Junction Capacitance versus Gate-Source Voltage

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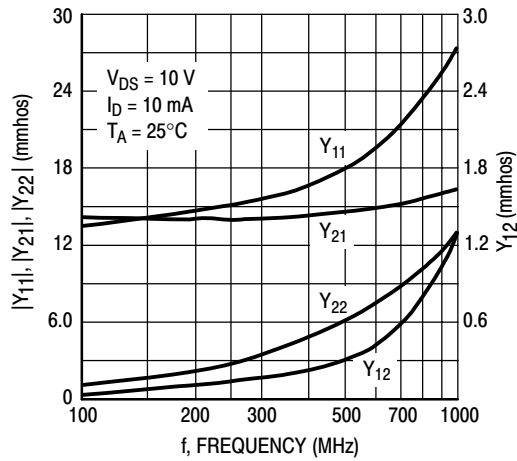


Figure 4. Common-Gate Y Parameter Magnitude versus Frequency

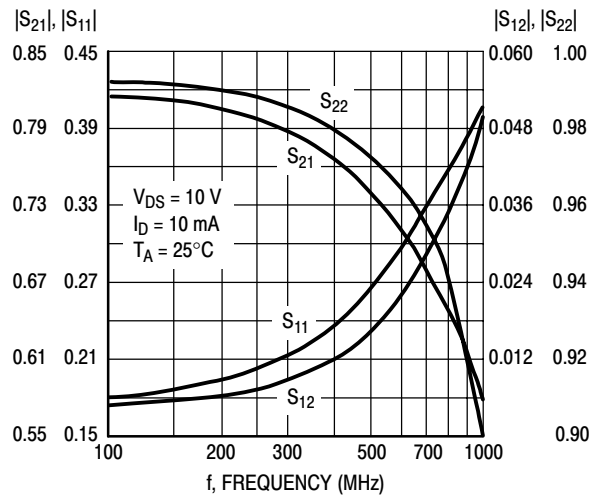


Figure 5. Common-Gate S Parameter Magnitude versus Frequency

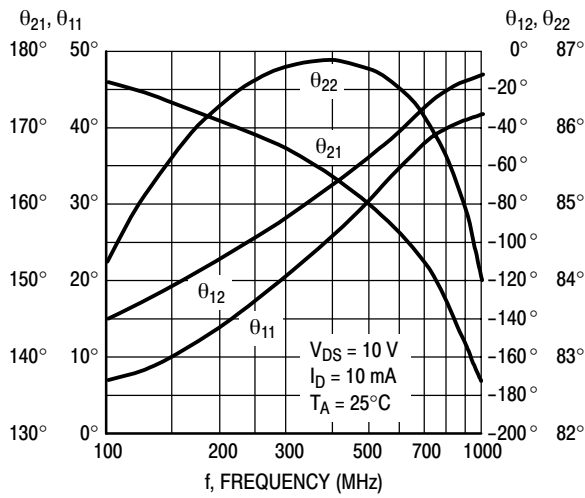


Figure 6. Common-Gate Y Parameter Phase-Angle versus Frequency

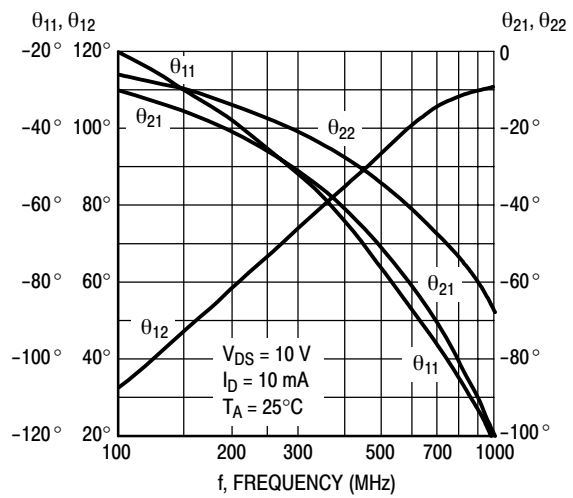
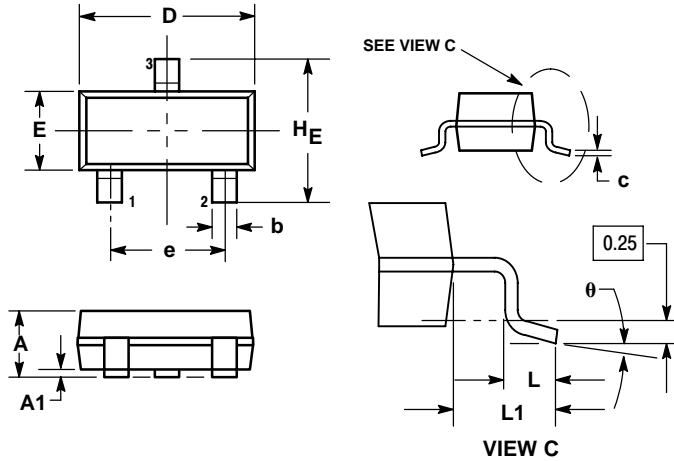


Figure 7. S Parameter Phase-Angle versus Frequency

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PACKAGE DIMENSIONS

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



NOTES:

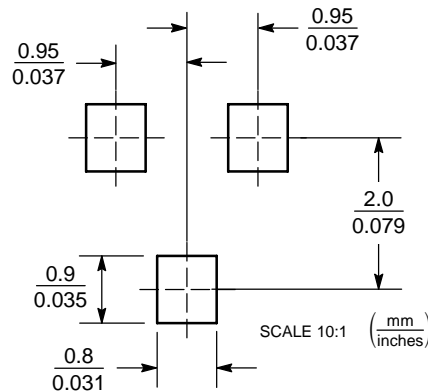
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
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	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 10:

1. DRAIN
2. SOURCE
3. GATE

SOLDERING 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.

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MMBFJ309LT1/D