BFR30LT1, BFR31LT1

JFET Amplifiers

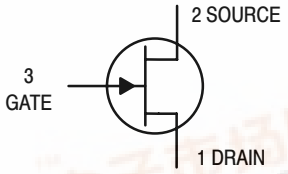
N−Channel

Features

- Pb−Free Package is Available

ON Semiconductor®

http://onsemi.com



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain−Source Voltage	V_{DS}	25	Vdc
Gate−Source Voltage	V_{GS}	25	Vdc

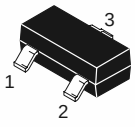
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

THERMAL CHARACTERISTICS

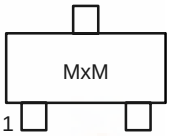
Characteristic	Symbol	Max	Unit
Total Device Dissipation (Note 1) T_A = 25°C Derate above 25°C	P_D	 225 1.8	 mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (Note 2) T_A = 25°C Derate above 25°C	P_D	 300 2.4	 mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J, T_{stg}	−55 to +150	°C

1. Device mounted on FR4 glass epoxy printed circuit board using the recommended footprint.
2. Alumina = 0.4 x 0.3 x 0.024 in 99.5% alumina.

MARKING DIAGRAM



SOT−23
CASE 318
STYLE 10



x = 1 or 2
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
BFR30LT1	SOT−23	3000/Tape & Reel
BFR30LT1G	SOT−23 (Pb−Free)	3000/Tape & Reel
BFR31LT1	SOT−23	3000/Tape & Reel
BFR31LT1G	SOT−23 (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 Specifications Brochure, BRD8011/D.

Publication Order Number:

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic			Symbol	Min	Max	Unit
OFF CHARACTERISTICS						
Gate Reverse Current	(V_{GS} = 10 Vdc, V_{DS} = 0)		I_{GSS}	–	0.2	nAdc
Gate Source Cutoff Voltage	(I_D = 0.5 nAdc, V_{DS} = 10 Vdc)	BFR30	$V_{GS(OFF)}$	–	5.0	Vdc
		BFR31		–	2.5	
Gate Source Voltage	(I_D = 1.0 mAdc, V_{DS} = 10 Vdc)	BFR30	V_{GS}	−0.7	−3.0	Vdc
		BFR31		–	−1.3	
	(I_D = 50 μAdc, V_{DS} = 10 Vdc)	BFR30		–	−4.0	
		BFR31		–	−2.0	
ON CHARACTERISTICS						
Zero−Gate−Voltage Drain Current	(V_{DS} = 10 Vdc, V_{GS} = 0)	BFR30	I_{DSS}	4.0	10	mAdc
		BFR31		1.0	5.0	
SMALL−SIGNAL CHARACTERISTICS						
Forward Transconductance			$\|y_{fs}\|$			mmhos
(I_D = 1.0 mAdc, V_{DS} = 10 Vdc, f = 1.0 kHz)		BFR30		1.0	4.0	
		BFR31		1.5	4.5	
(I_D = 200 μAdc, V_{DS} = 10 Vdc, f = 1.0 kHz)		BFR30		0.5	–	
		BFR31		0.75	–	
Output Admittance			$\|y_{os}\|$			μmhos
(I_D = 1.0 mAdc, V_{DS} = 10 Vdc, f = 1.0 kHz)		BFR30		40	25	
(I_D = 200 μAdc, V_{DS} = 10 Vdc)		BFR31		20	15	
Input Capacitance	(I_D = 1.0 mAdc, V_{DS} = 10 Vdc, f = 1.0 MHz)		C_{iss}	–	5.0	pF
	(I_D = 200 μAdc, V_{DS} = 10 Vdc, f = 1.0 MHz)			–	4.0	
Reverse Transfer Capacitance	(I_D = 1.0 mAdc, V_{DS} = 10 Vdc, f = 1.0 MHz)		C_{rss}	–	1.5	pF
	(I_D = 200 μAdc, V_{DS} = 10 Vdc, f = 1.0 MHz)			–	1.5	

TYPICAL CHARACTERISTICS

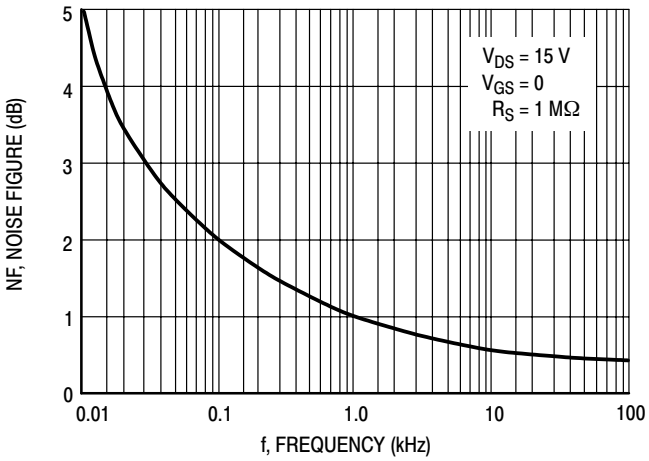


Figure 1. Noise Figure versus Frequency

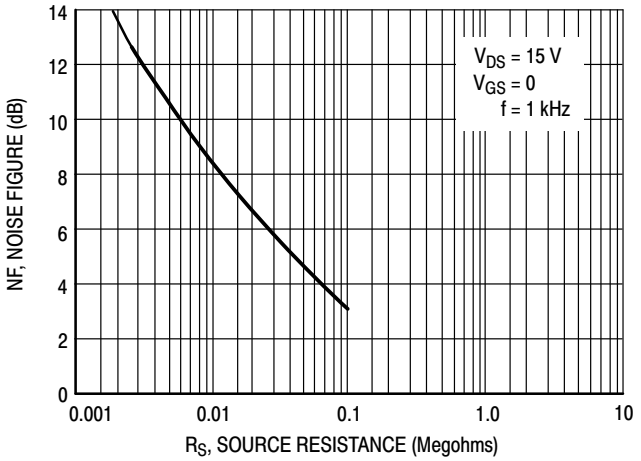


Figure 2. Noise Figure versus Source Resistance

TYPICAL CHARACTERISTICS

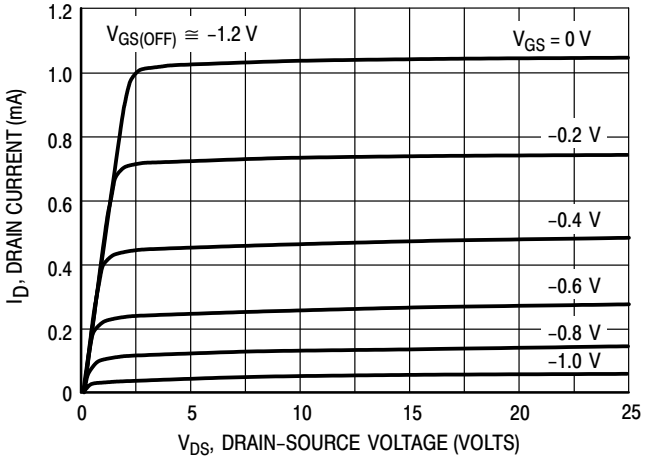


Figure 3. Typical Drain Characteristics

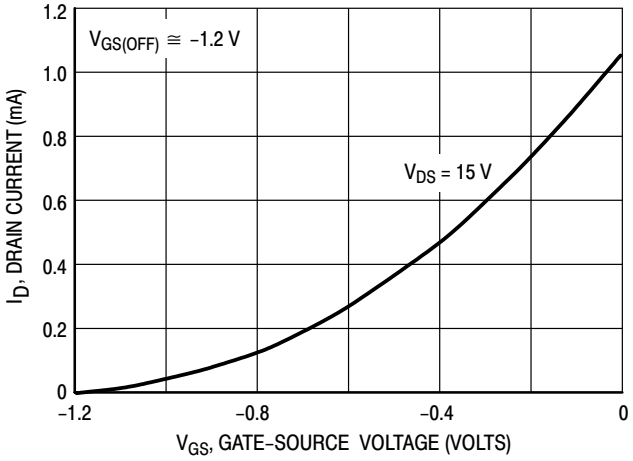


Figure 4. Common Source Transfer Characteristics

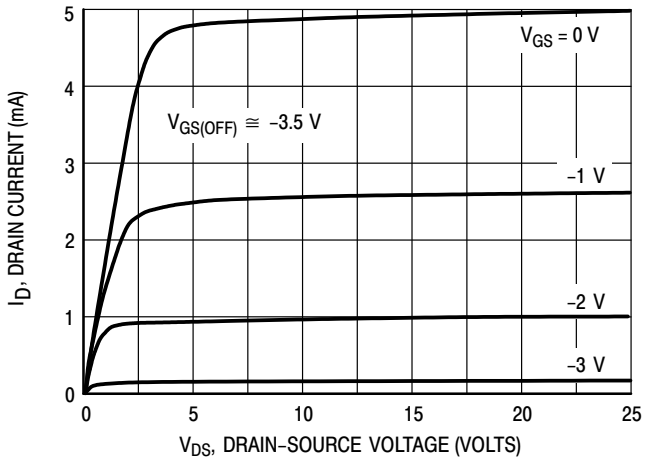


Figure 5. Typical Drain Characteristics

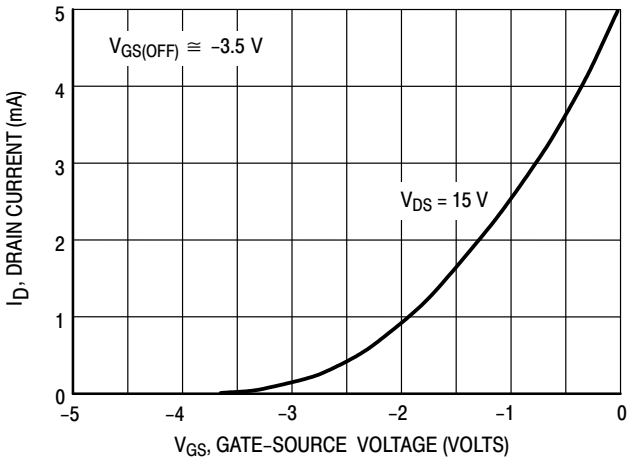


Figure 6. Common Source Transfer Characteristics

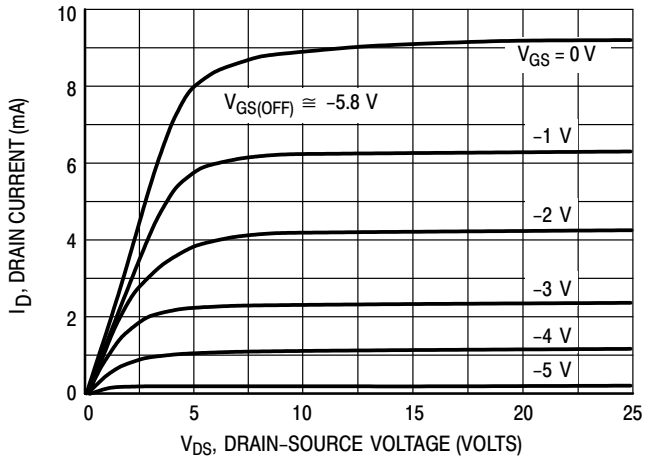


Figure 7. Typical Drain Characteristics

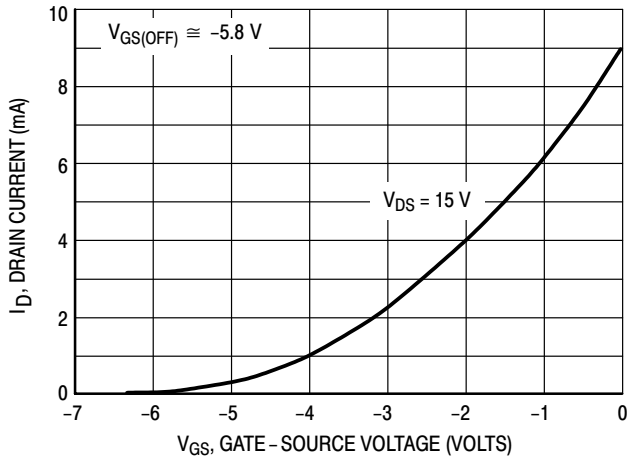
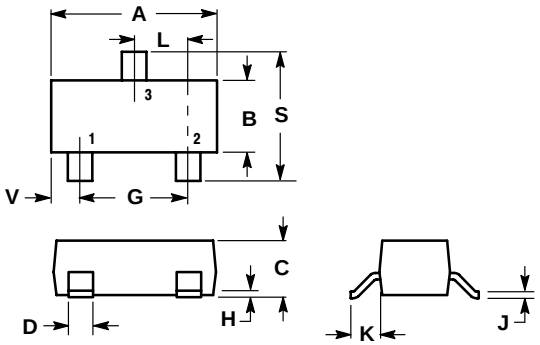


Figure 8. Common Source Transfer Characteristics

Note: Graphical data is presented for dc conditions. Tabular data is given for pulsed conditions (Pulse Width = 630 ms, Duty Cycle = 10%). Under dc conditions, self heating in higher I_{DSS} units reduces I_{DSS}.

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AK

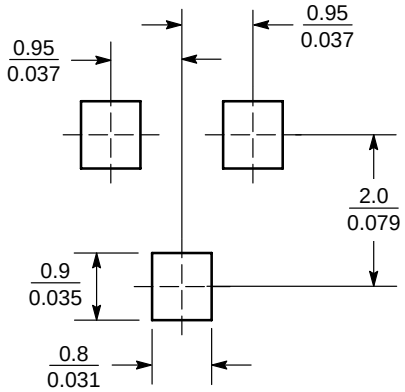


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01 THRU −07 AND −09 OBSOLETE, NEW STANDARD 318−08.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

SOLDERING FOOTPRINT*



SCALE 10:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
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