BFR30LT1, BFR31LT1

JFET Amplifiers

N−Channel

Features

- Pb−Free Package is Available

ON Semiconductor®

2 SOURCE

3 GATE

1 DRAIN

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.
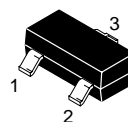2. Alumina = 0.4 x 0.3 x 0.024 in 99.5% alumina.
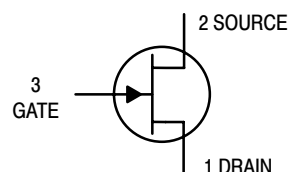
MARKING DIAGRAM

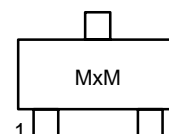SOT−23 CASE 318 STYLE 10

MxM

1

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.

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

TYPICAL CHARACTERISTICS

V_{DS} = 15 V
V_{GS} = 0
R_S = 1 MΩ
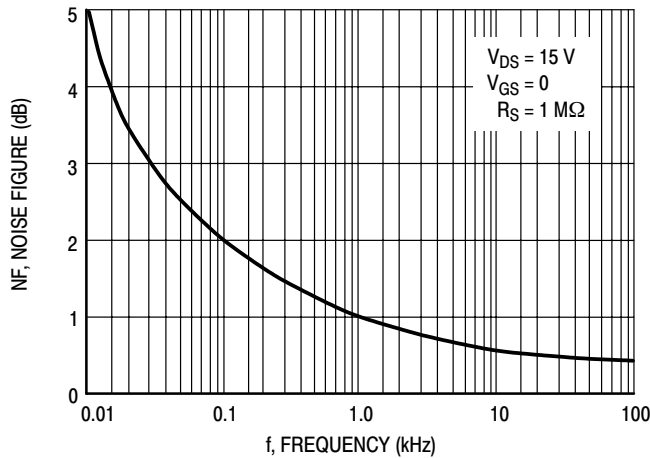
Figure 1. Noise Figure versus Frequency

V_{DS} = 15 V
V_{GS} = 0
f = 1 kHz

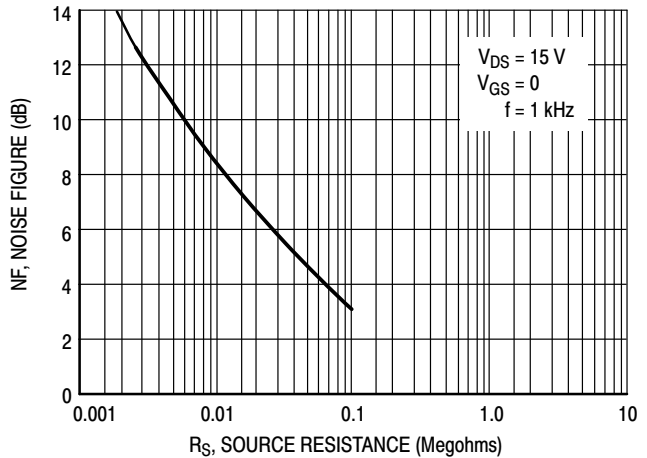**Figure 2. Noise Figure versus Source Resistance**

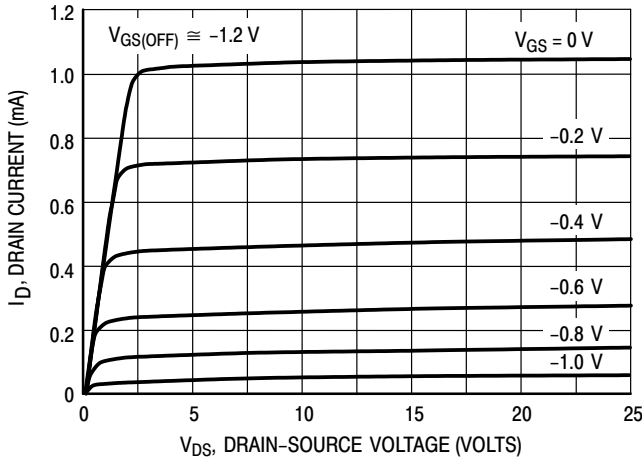## TYPICAL CHARACTERISTICS

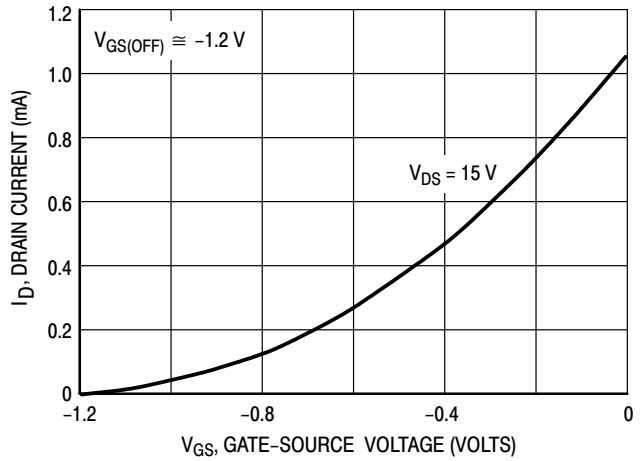**Figure 3. Typical Drain Characteristics**

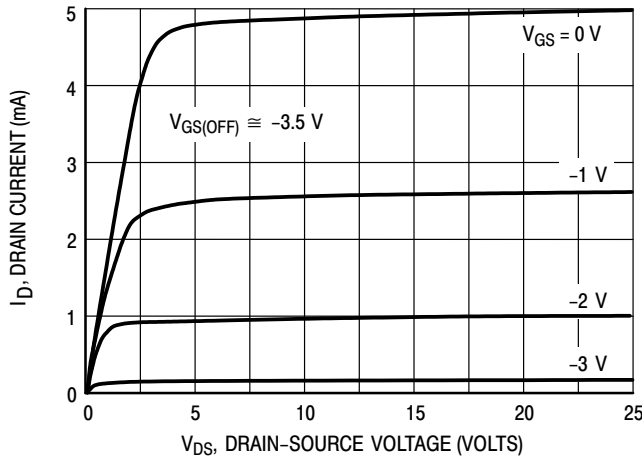**Figure 4. Common Source Transfer Characteristics**

Figure 5. Typical Drain Characteristics
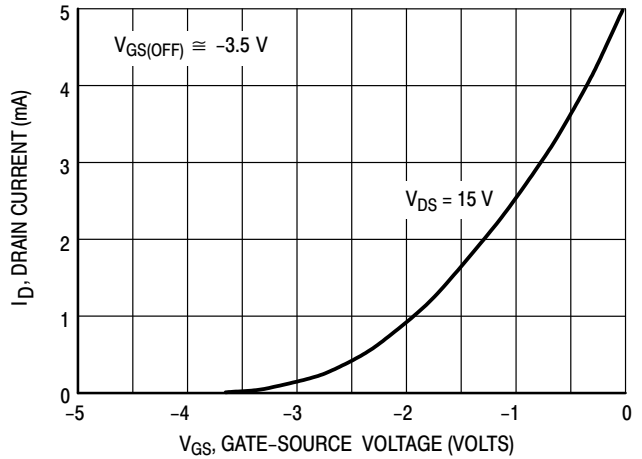

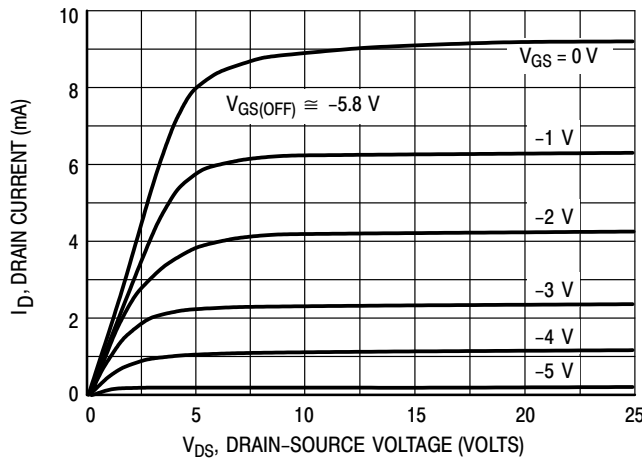**Figure 6. Common Source Transfer Characteristics**

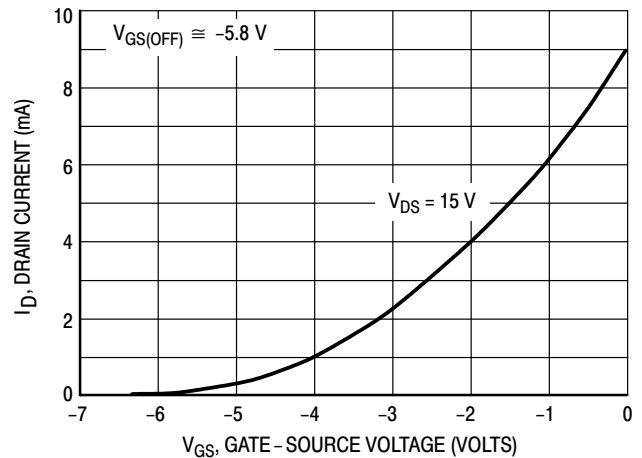**Figure 7. Typical Drain Characteristics**

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}.

ADDITIONAL INFORMATION

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