SEMICONDUCTOR
TECHNICAL DATA

2N3821,
2N3822
2N3823

N-Channel, Depletion Mode
Junction Field-Effect Transistors (JFETs)

. . .designed for small-signal, low-noise amplifier applications.

MAXIMUM RATINGS

Rating	Symbol	2N3821 2N3822	2N3823	Unit
Drain-Gate Voltage	V_{DG}	50	30	Vdc
Drain-Source Voltage	V_{DS}	50	30	Vdc
Reverse Gate-Source Voltage	V_{GSR}	–50	–30	Vdc
Gate Current	I_{GF}	10		mAdc
Device Dissipation Derate above 25°C	P_T	300 1.7		mW mW/°C
Storage Temperature Range	T_{stg}	–65 to 200		°C

CASE 20-03
TO-206AF (TO-72)

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Gate-Source Breakdown Voltage (I_G = –1.0 µAdc, V_{DS} = 0)	2N3821, 2N3822 2N3823	$V_{(BR)GSSR}$	–50 –30	— —	Vdc
Gate Reverse Current (V_{GS} = –30 Vdc, V_{DS} = 0) (V_{GS} = –20 Vdc, V_{DS} = 0) (V_{GS} = –30 Vdc, V_{DS} = 0, T_A = 150°C) (V_{GS} = –20 Vdc, V_{DS} = 0, T_A = 150°C)	2N3821, 2N3822 2N3823 2N3821, 2N3822 2N3823	I_{GSSR}	— — — —	–0.1 –0.5 –0.1 –0.5	nAdc nAdc µAdc µAdc
Gate-Source Cutoff Voltage (V_{DS} = 15 Vdc, I_D = 0.5 nAdc)	2N3821 2N3822 2N3823	$V_{GS(off)}$	— — —	–4.0 –6.0 –8.0	Vdc
Gate-Source Voltage (V_{DS} = 15 Vdc, I_D = 50 µAdc) (V_{DS} = 15 Vdc, I_D = 200 µAdc) (V_{DS} = 15 Vdc, I_D = 400 µAdc)	2N3821 2N3822 2N3823	V_{GS}	–0.5 –1.0 –1.0	–2.0 –4.0 –7.5	Vdc
Insulation Resistance Case-to-Gate		R_{iso}	10^{10}	—	ohms

(continued)

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ELECTRICAL CHARACTERISTICS — continued (T_A = 25°C unless otherwise noted.)					
Characteristic		**Symbol**	**Min**	**Max**	**Unit**
ON CHARACTERISTICS					
Zero-Gate-Voltage Drain Current(1) (V_{DS} = 15 Vdc, V_{GS} = 0)	2N3821 2N3822 2N3823	I_{DSS}	0.5 2.0 4.0	2.5 10 20	mAdc
SMALL-SIGNAL CHARACTERISTICS					
Forward Transfer Admittance(1)		$\|Y_{fs}\|$			µmhos
(V_{DS} = 15 Vds, V_{GS} = 0, f = 1.0 kHz)	2N3821 2N3822 2N3823		1500 3000 3500	4500 6500 6500	
(V_{DS} = 15 Vdc, V_{GS} = 0)					
(f = 100 MHz)	2N3821		1500	—	
(f = 100 MHz)	2N3822		3000	—	
(f = 200 MHz)	2N3823		3200	—	
(V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz, T_A = –65°C)(1)	2N3821 2N3822, 2N3823		— —	6750 9750	
Output Admittance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)	2N3821 2N3822 2N3823	$\|Y_{os}\|$	— — —	10 20 35	µmhos
Input Capacitance (V_{DS} = 15 Vdc, V_{GS}= 0, f = 0.1 to 1.0 MHz)		C_{iss}	—	6.0	pF
Reverse Transfer Capacitance (V_{DS} = 15 Vdc, V_{GS}= 0, f = 0.1 to 1.0 MHz)	2N3821, 2N3822 2N3823	C_{rss}	— —	3.0 2.0	pF
Noise Figure		NF			dB
(V_{DS} = 15 Vdc, V_{GS} = 0)					
(f = 10 Hz, R_G = 1.0 MΩ)	2N3821, 2N3822		—	5.0	
(f = 1.0 kHz, R_G = 1.0 MΩ) (See Figure 7)	All Types		—	2.5	
Input Conductance (V_{DS} = 15 Vdc, V_{GS}= 0, f = 200 MHz)	2N3823 Only	g_{is}	—	800	µs
Output Conductance (V_{DS} = 15 Vdc, V_{GS}= 0, f = 200 MHz)	2N3823 Only	g_{os}	—	200	µs

ASSURANCE TESTING (Pre/Post Burn-In) **Burn-In Conditions: T_A = 175°C, V_{DS} = 0, V_{GS} = –40 Vdc 2N3821, 2N3822, –24 Vdc 2N3823**					
			Initial and End Point Limits		
Characteristics Tested		**Symbol**	**Min**	**Max**	**Unit**
Gate Reverse Current (V_{GS} = 30 Vdc, V_{DS} = 0)		I_{GSSR}	—	–0.1	nAdc
Zero-Gate Voltage Drain Current(1) (V_{DS} = –15 Vdc, V_{GS} = 0)	2N3821 2N3822	I_{DSS}	0.5 2.0	2.5 10	mAdc
Forward Transfer Admittance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)	2N3821 2N3822	$\|Y_{fs}\|$	1500 3000	4500 6500	µmhos

Delta from Pre-Burn-In Measured Values		**Min**	**Max**	
Delta Zero-Gate-Voltage Drain Current(1)	ΔI_{DSS}	—	±10	% of Initial Value
Delta Forward Transfer Admittance	$\Delta\|Y_{fs}\|$	—	±20	% of Initial Value

(1) Pulsed: Pulse Width 250 to 350 µs, Duty Cycle 1.0 to 2.0%

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