2N3821
2N3822
2N3824

CASE 20-03, STYLE 1
TO-72 (TO-206AF)

JFET
LOW FREQUENCY, LOW NOISE

N-CHANNEL — DEPLETION
JAN 2N3821 AND JAN 2N3822 AVAILABLE

Refer to 2N4220 for graphs.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	Vdc
Drain-Gate Voltage	V_{DG}	50	Vdc
Gate-Source Voltage	V_{GS}	−50	Vdc
Drain Current	I_D	10	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	300 2.0	mW mW/°C
Junction Temperature Range	T_J	175	°C
Storage Temperature Range	T_{stg}	−65 to +200	°C

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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)		$V_{(BR)GSS}$	−50	—	Vdc
Gate Reverse Current (V_{GS} = −30 Vdc, V_{DS} = 0) (V_{GS} = −30 Vdc, V_{DS} = 0, T_A = 150°C)		I_{GSS}	 — —	 −0.1 −100	nAdc
Gate Source Cutoff Voltage (I_D = 0.5 nAdc, V_{DS} = 15 Vdc)	2N3821 2N3822	$V_{GS(off)}$	 — —	 −4.0 −6.0	Vdc
Gate Source Voltage (I_D = 50 μAdc, V_{DS} = 15 Vdc) (I_D = 200 μAdc, V_{DS} = 15 Vdc)	 2N3821 2N3822	V_{GS}	 −0.5 −1.0	 −2.0 −4.0	Vdc
Drain Cutoff Current (V_{DS} = 15 Vdc, V_{GS} = −8.0 Vdc) (V_{DS} = 15 Vdc, V_{GS} = −8.0 Vdc, T_A = 150°C)	 2N3824 2N3824	$I_{D(off)}$	 — —	 0.1 100	nAdc
ON CHARACTERISTICS					
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
Static Drain-Source On Resistance (V_{GS} = 0, I_D = 0, f = 1.0 kHz)	2N3824	$r_{DS(on)}$	—	250	Ohms
SMALL-SIGNAL CHARACTERISTICS					
Forward Transfer Admittance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)(1) (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz)	 2N3821 2N3822 2N3821 2N3822	$\lvert y_{fs} \rvert$	 1500 3000 1500 3000	 4500 6500 — —	μmhos
Output Admittance(1) (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)	 2N3821 2N3822	$\lvert y_{os} \rvert$	 — —	 10 20	μmhos
Input Capacitance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	—	6.0	pF
Reverse Transfer Capacitance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 MHz) (V_{GS} = −8.0 Vdc, V_{DS} = 0, f = 1.0 MHz)	 2N3821 2N3822 2N3824	C_{rss}	 — — —	 3.0 3.0 3.0	pF

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

Characteristic		Symbol	Min	Max	Unit
FUNCTIONAL CHARACTERISTICS					
Noise Figure (V_{DS} = 15 Vdc, V_{GS} = 0, R_S = 1.0 megohm, f = 10 Hz, Noise Bandwidth = 5.0 Hz)	2N3821, 2N3822	NF	—	5.0	dB
Equivalent Input Noise Voltage (V_{DS} = 15 Vdc, V_{GS} = 0, f = 10 Hz, Noise Bandwidth = 5.0 Hz)	2N3821, 2N3822	e_n	—	200	$nv/Hz^{1/2}$

(1) Pulse Test: Pulse Width ≤ 100 ms, Duty Cycle ≤ 10%.