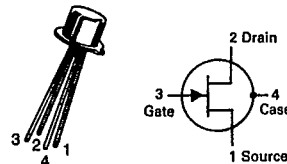


**2N3821,
2N3822
2N3824**
**CASE 20-03, STYLE 1
TO-72 (TO-206AF)**

**JFETs
LOW FREQUENCY, LOW NOISE**
**N-CHANNEL — DEPLETION
JAN, JTX 2N3821 AND JAN, JTX 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	mA
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.0	mW mW/ $^\circ\text{C}$
Junction Temperature Range	T_J	175	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Gate-Source Breakdown Voltage ($I_G = -1.0 \mu\text{A}$, $V_{DS} = 0$)	$V_{(BR)GSS}$	-50	—	Vdc
Gate Reverse Current ($V_{GS} = -30 \text{ Vdc}$, $V_{DS} = 0$) ($V_{GS} = -30 \text{ Vdc}$, $V_{DS} = 0$, $T_A = 150^\circ\text{C}$)	I_{GSS}	—	-0.1 -100	nA
Gate Source Cutoff Voltage ($I_D = 0.5 \text{ nA}$, $V_{DS} = 15 \text{ Vdc}$)	$V_{GS(off)}$	—	-4.0 -6.0	Vdc
Gate Source Voltage ($I_D = 50 \mu\text{A}$, $V_{DS} = 15 \text{ Vdc}$) ($I_D = 200 \mu\text{A}$, $V_{DS} = 15 \text{ Vdc}$)	V_{GS}	-0.5 -1.0	-2.0 -4.0	Vdc
Drain Cutoff Current ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = -8.0 \text{ Vdc}$) ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = -8.0 \text{ Vdc}$, $T_A = 150^\circ\text{C}$)	$I_{D(off)}$	—	0.1 100	nA
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current(1) ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$)	I_{DSS}	0.5 2.0	2.5 10	mA
Static Drain-Source On Resistance ($V_{GS} = 0$, $I_D = 0$, $f = 1.0 \text{ kHz}$)	$r_{DS(on)}$	—	250	Ohms
SMALL-SIGNAL CHARACTERISTICS				
Forward Transfer Admittance ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ kHz}$)(1)	$ y_{fs} $	1500 3000	4500 6500	μmhos
($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 100 \text{ MHz}$)		1500 3000	— —	
Output Admittance(1) ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ kHz}$)	$ y_{os} $	— —	10 20	μmhos
Input Capacitance ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{iss}	—	6.0	pF
Reverse Transfer Capacitance ($V_{DS} = 15 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{rss}	— —	3.0 3.0	pF
($V_{GS} = -8.0 \text{ Vdc}$, $V_{DS} = 0$, $f = 1.0 \text{ MHz}$)		—	3.0	

MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES

2N3821, 2N3822, 2N3824

T-29-25

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

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

(1) Pulse Test: Pulse Width $\leq 100\text{ ms}$, Duty Cycle $\leq 10\%$.