

2N3821, 2N3822

N-Channel Silicon Junction Field-Effect Transistor

- VHF Amplifiers
- Small Signal Amplifiers

Absolute maximum ratings at $T_A = 25^\circ\text{C}$

Reverse Gate Source & Reverse Gate Drain Voltage

– 50 V

Continuous Forward Gate Current

10 mA

Continuous Device Power Dissipation

300 mW

Power Derating

2mW/°C

At 25°C free air temperature:

Static Electrical Characteristics

		2N3821		2N3822		Process NJ32		
		Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		V	$I_G = -1\ \mu\text{A}$, $V_{DS} = 0\text{V}$	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1	nA	$V_{GS} = -30\text{V}$, $V_{DS} = 0\text{V}$	
			– 0.1		– 0.1	μA	$V_{GS} = -30\text{V}$, $V_{DS} = 0\text{V}$	$T_A = 150^\circ\text{C}$
Gate Source Voltage	V_{GS}	– 0.5	– 2			V	$V_{DS} = 15\text{V}$, $I_D = 50\ \mu\text{A}$	
				– 1	– 4	V	$V_{DS} = 15\text{V}$, $I_D = 200\ \mu\text{A}$	
						V	$V_{DS} = 15\text{V}$, $I_D = 400\ \mu\text{A}$	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 4		– 6	V	$V_{DS} = 15\text{V}$, $I_D = 0.5\ \text{nA}$	
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	2.5	2	10	mA	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	
Drain Cutoff Current	$I_{D(OFF)}$					nA	$V_{DS} = 15\text{V}$, $V_{GS} = -8\text{V}$	
						μA	$V_{DS} = 15\text{V}$, $V_{GS} = -8\text{V}$	$T_A = 150^\circ\text{C}$

Dynamic Electrical Characteristics

Drain Source ON Resistance	$r_{ds(on)}$					Ω	$V_{GS} = 0\text{V}$, $I_D = 0\text{V}$	$f = 1\ \text{kHz}$
Common Source Forward Transconductance	g_{fs}	1500	4500	3000	6500	μS	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 1\ \text{kHz}$
Common Source Forward Transmittance	$ Y_{fs} $	1500		3000		μS	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 100\ \text{MHz}$
Common Source Output Conductance	g_{os}		10		20	μS	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 1\ \text{kHz}$
Common Source Input Capacitance	C_{iss}		6		6	pF	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 1\ \text{MHz}$
Common Source Reverse Transfer Capacitance	C_{rss}		2		2	pF	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 1\ \text{MHz}$
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		200		200	nV/ $\sqrt{\text{Hz}}$	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$	$f = 10\ \text{Hz}$
Noise Figure	NF		5		5	dB	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$ $R_G = 1\ \text{M}\Omega$	$f = 10\ \text{Hz}$

TO-72 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate, 4 Case



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