

NTE452

Silicon N-Channel JFET Transistor VHF Amplifier, Mixer

Description:

The NTE452 is a silicon, N-channel junction field effect transistor (JFET) in a TO72 type package designed to be used in the depletion mode in VHF/UHF amplifiers.

Absolute Maximum Ratings:

Drain-Source Voltage, V_{DS} 30V
 Drain-Gate Voltage, V_{DG} 35V
 Gate-Source Voltage, V_{GS} 30V
 Gate Current, I_G 10mA
 Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D 300mW
 Derate Above 25°C 1.71mW/ $^\circ\text{C}$
 Operating Junction Temperature Range, T_J -65° to $+175^\circ\text{C}$
 Storage Temperature Range, T_{stg} -65° to $+175^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = 1\mu\text{s}$, $V_{DS} = 0$	30	—	—	V
Gate Reverse Current	I_{GSS}	$V_{GS} = 20\text{V}$, $V_{DS} = 0$	—	—	100	pA
		$V_{GS} = 20\text{V}$, $V_{DS} = 0$, $T_A = +150^\circ\text{C}$	—	—	200	pA
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D = 1\text{nA}$, $V_{DS} = 15\text{V}$	—	—	6	V
Gate-Source Voltage	V_{GS}	$I_D = 0.5\text{mA}$, $V_{DS} = 15\text{V}$	1.0	—	5.5	V
Gate-Source Forward Voltage	$V_{GS(f)}$	$I_G = 1\text{mA}$, $V_{DS} = 0$	—	—	1.0	V
ON Characteristics (Note 1)						
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 15\text{V}$, $V_{GS} = 0$	5	—	15	mA
Small-Signal Characteristics						
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 15\text{V}$, $V_{GS} = 0$, $f = 1\text{kHz}$, Note 1	4500	—	7500	μmhos
Real Part of Forward Transfer Admittance	$Y_{fs(\text{real})}$	$V_{DS} = 15\text{V}$, $V_{GS} = 0$, $f = 400\text{MHz}$	4000	—	—	μmhos

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$.

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small-Signal Characteristics (Cont'd)						
Real Part of Input Admittance	$Y_{is(\text{real})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	—	—	100	μmhos
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	—	—	1000	μmhos
Output Admittance	$ Y_{os} $	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{kHz}$	—	—	50	μmhos
Real Part of Output Admittance	$Y_{os(\text{real})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	—	—	75	μmhos
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	—	—	100	μmhos
Imaginary Part of Input Admittance	$Y_{is(\text{imag})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	—	—	2500	μmhos
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	—	—	10k	μmhos
Imaginary Part of Output Admittance	$Y_{os(\text{imag})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	—	—	1000	μmhos
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	—	—	4000	μmhos
Input Capacitance	C_{iss}	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	—	4.0	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	—	0.8	pF
Common-Source Output Capacitance	C_{oss}	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	—	2.0	pF
Functional Characteristics						
Noise Figure	NF	$V_{DS} = 15\text{V}, I_D = 5\text{mA}, R_g \sim 1000\Omega, f = 100\text{MHz}$	—	—	2.0	dB
		$V_{DS} = 15\text{V}, I_D = 5\text{mA}, R_g \sim 1000\Omega, f = 400\text{MHz}$	—	—	4.0	dB
Small-Signal Power Gain Common-Source	G_{ps}	$V_{DS} = 15\text{V}, I_D = 5\text{mA}, f = 100\text{MHz}$	18	—	—	dB
		$V_{DS} = 15\text{V}, I_D = 5\text{mA}, f = 400\text{MHz}$	10	—	—	dB

