

## 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 $25^\circ\text{C}$ .....	1.71mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+175^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+175^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
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
<b>ON Characteristics (Note 1)</b>						
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 15\text{V}, V_{GS} = 0$	5	-	15	mA
<b>Small-Signal Characteristics</b>						
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{kHz}, \text{Note 1}$	4500	-	7500	$\mu\text{mhos}$
Real Part of Forward Transfer Admittance	$Y_{fs(real)}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	4000	-	-	$\mu\text{mhos}$

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
<b>Small-Signal Characteristics (Cont'd)</b>						
Real Part of Input Admittance	$Y_{is(\text{real})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	–	–	100	$\mu\text{hos}$
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	–	–	1000	$\mu\text{hos}$
Output Admittance	$ Y_{os} $	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 1\text{kHz}$	–	–	50	$\mu\text{hos}$
Real Part of Output Admittance	$Y_{os(\text{real})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	–	–	75	$\mu\text{hos}$
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	–	–	100	$\mu\text{hos}$
Imaginary Part of Input Admittance	$Y_{is(\text{imag})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	–	–	2500	$\mu\text{hos}$
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	–	–	10k	$\mu\text{hos}$
Imaginary Part of Output Admittance	$Y_{os(\text{imag})}$	$V_{DS} = 15\text{V}, V_{GS} = 0, f = 100\text{MHz}$	–	–	1000	$\mu\text{hos}$
		$V_{DS} = 15\text{V}, V_{GS} = 0, f = 400\text{MHz}$	–	–	4000	$\mu\text{hos}$
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
<b>Functional Characteristics</b>						
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

