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NTE452
Silicon N–Channel JFET Transistor
VHF Amplifier, Mixer

Description:

The NTE452 is a silicon, N–channel junction field effect tranistor (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°C), P_D 300mW
Derate Above 25°C . . . . . 1.71mW/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +175°C
Storage Temperature Range, T_{stg} . . . . . –65° to +175°C

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

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

Note 1. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 1%.

Electrical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

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

