

N-Channel Silicon Junction Field-Effect Transistor

- Mixer
- Oscillator
- VHF/UHF Amplifier

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

Reverse Gate Source & Reverse Gate Drain Voltage

– 25 V

Continuous Forward Gate Current

20 mA

Continuous Device Power Dissipation

500 mW

Power Derating

4 mW/°C

At 25°C free air temperature:

Static Electrical Characteristics

		U310			Process NJ72L		
		Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	$I_G = -1\ \mu\text{A}$, $V_{DS} = \emptyset\text{V}$	
Gate Reverse Current	I_{GSS}			– 150	pA	$V_{GS} = -15\text{V}$, $V_{DS} = \emptyset\text{V}$	
				– 150	nA	$V_{GS} = -15\text{V}$, $V_{DS} = \emptyset\text{V}$	$T_A = 125^\circ\text{C}$
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2.5		– 6	V	$V_{DS} = 10\text{V}$, $I_D = 1\text{ nA}$	
Gate Source Forward Voltage	$V_{GS(F)}$			1	V	$V_{DS} = \emptyset\text{V}$, $I_G = 10\text{ mA}$	
Drain Saturation Current (Pulsed)	I_{DSS}	24		60	mA	$V_{DS} = 10\text{V}$, $V_{GS} = \emptyset\text{V}$	

Dynamic Electrical Characteristics

Common Gate Forward Transconductance		10	17		mS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 1\text{ kHz}$
	g_{fg}		15		mS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 105\text{ MHz}$
			14		mS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 450\text{ MHz}$
Common Gate Output Conductance				250	μS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 1\text{ kHz}$
	g_{og}		0.18		μS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 105\text{ MHz}$
			0.32		μS	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 450\text{ MHz}$
Drain Gate Capacitance	C_{dg}			2.5	pF	$V_{DS} = 10\text{V}$, $V_{GS} = -10\text{V}$	$f = 1\text{ MHz}$
Gate Source Capacitance	C_{gs}			5	pF	$V_{DS} = 10\text{V}$, $V_{GS} = -10\text{V}$	$f = 1\text{ MHz}$
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10		nV/√Hz	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 100\text{ Hz}$
Common Gate Power Gain	G_{pg}	14	16		dB	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 105\text{ MHz}$
		10	11		dB	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 450\text{ MHz}$
Noise Figure	NF		1.5	2	dB	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 105\text{ MHz}$
			2.7	3.5	dB	$V_{DS} = 10\text{V}$, $I_D = 10\text{ mA}$	$f = 450\text{ MHz}$

TO-52 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source, 2 Drain, 3 Gate & Case

Surface Mount

SMPJ310

