

U308, U309

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- Oscillators
- VHF/UHF Amplifiers

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

		U308			U309			Process NJ72	
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			– 25			V	$V_{GS} = -1\mu\text{A}$, $V_{DS} = 0\text{V}$
Gate Reverse Current	I_{GSS}			– 150			– 150	pA	$V_{GS} = -15\text{V}$, $V_{DS} = 0\text{V}$
				– 150			– 150	nA	$V_{GS} = -15\text{V}$, $V_{DS} = 0\text{V}$, $T_A = +125^\circ\text{C}$
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 6	– 1		– 4	V	$V_{DS} = 10\text{V}$, $I_D = 1\text{nA}$
Gate Source Forward Voltage	$V_{GS(F)}$			1			1	V	$V_{DS} = 0\text{V}$, $I_G = 10\text{mA}$
Drain Saturation Current (Pulsed)	I_{DSS}	12		60	12		30	mA	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$

Dynamic Electrical Characteristics

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

TO-52 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate & Case

Surface Mount

SMPJ308/J309



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