

**2N3957, 2N3958****N-Channel Dual Silicon Junction Field-Effect Transistor**

- Low and Medium Frequency Differential Amplifiers**
- High Input Impedance Amplifiers**

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

Reverse Gate Source & Reverse Gate Drain Voltage	- 50 V
Gate Current	50 mA
Total Device Power Dissipation (each side)	250 mW
@ 85°C Case Temperature (both sides)	500 mW
Power Derating (both sides)	4.3 mW/°C

**At 25°C free air temperature:**

		2N3957		2N3958		Process NJ16	
		Min	Max	Min	Max	Unit	Test Conditions
Gate Source Breakdown Voltage	$V_{(\text{BR})\text{GSS}}$	- 50		- 50		V	$I_G = - 1 \mu\text{A}, V_{DS} = \emptyset\text{V}$
Gate Reverse Current	$I_{GSS}$		- 100		- 100	pA	$V_{GS} = - 30\text{V}, V_{DS} = \emptyset\text{V}$
			- 500		- 500	nA	$V_{GS} = - 30\text{V}, V_{DS} = \emptyset\text{V}$
Gate Operating Current	$I_G$		- 50		- 50	pA	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$
			- 250		- 250	nA	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$
Gate Source Voltage	$V_{GS}$		- 4.2		- 4.2	V	$V_{DS} = 20\text{V}, I_D = 50 \mu\text{A}$
		- 0.5	- 4	- 0.5	- 4	V	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$
Gate Source Cutoff Voltage	$V_{GS(\text{OFF})}$	- 1	- 4.5	- 1	- 4.5	V	$V_{DS} = 20\text{V}, I_D = 1 \text{nA}$
Gate Source Forward Voltage	$V_{GS(F)}$		2		2	V	$V_{DS} = \emptyset, I_G = 1 \text{mA}$
Drain Saturation Current (Pulsed)	$I_{DSS}$	0.5	5	0.5	5	mA	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$

**Dynamic Electrical Characteristics**

Common Source Forward Transconductance	$g_{fs}$	1000	3000	1000	3000	$\mu\text{S}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 1 \text{ kHz}$
		1000		1000		$\mu\text{S}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 200 \text{ MHz}$
Common Source Output Conductance	$g_{os}$		35		35	$\mu\text{S}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 1 \text{ kHz}$
Common Source Input Capacitance	$C_{iss}$		4		4	$\text{pF}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 1 \text{ MHz}$
Drain Gate Capacitance	$C_{dgo}$		1.5		1.5	$\text{pF}$	$V_{DS} = 10\text{V}, I_S = \emptyset\text{A}$	$f = 1 \text{ MHz}$
Common Source Reverse Transfer Capacitance	$C_{rss}$		1.2		1.2	$\text{pF}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	$f = 1 \text{ MHz}$
Noise Figure	NF		0.5		0.5	$\text{dB}$	$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$ $R_G = 10\text{M}\Omega$	$f = 100 \text{ Hz}$
Differential Gate Current	$ I_{G1} - I_{G2} $		10		10	nA	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$	$T_A = 125^\circ\text{C}$
Saturation Drain Current Ratio	$I_{DSS1} / I_{DSS2}$	0.9	1	0.85	1		$V_{DS} = 20\text{V}, V_{GS} = \emptyset\text{V}$	
Differential Gate Source Voltage	$ V_{GS1} - V_{GS2} $		20		25	mV	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$	
Differential Gate Source Voltage with Temperature	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		6		8	mV	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$	$T_A = 25^\circ\text{C}$ to $-55^\circ\text{C}$
			7.5		10	mV	$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$	$T_A = 25^\circ\text{C}$ to $125^\circ\text{C}$
Transconductance Ratio	$g_{fs1} / g_{fs2}$	0.9	1	0.85	1		$V_{DS} = 20\text{V}, I_D = 200 \mu\text{A}$	$f = 1 \text{ kHz}$