

2N3954, 2N3955, 2N3956

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) @ 85°C Case Temperature (both sides)	250 mW 500 mW
Power Derating (both sides)	4.3 mW/°C

At 25°C free air temperature:
Static Electrical Characteristics

		2N3954		2N3955		2N3956		Process NJ16	
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	- 50		- 50		- 50		V	$I_G = -1\mu\text{A}$, $V_{DS} = \emptyset\text{V}$
Gate Reverse Current	I_{GSS}		- 100		- 100		- 100	pA	$V_{GS} = -30\text{V}$, $V_{DS} = \emptyset\text{V}$
			- 500		- 500		- 500	nA	$V_{GS} = -30\text{V}$, $V_{DS} = \emptyset\text{V}$ $T_A = 125^\circ\text{C}$
Gate Operating Current	I_G		- 50		- 50		- 50	pA	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$
			- 250		- 250		- 250	nA	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$ $T_A = 125^\circ\text{C}$
Gate Source Voltage	V_{GS}		- 4.2		- 4.2		- 4.2	V	$V_{DS} = 20\text{V}$, $I_D = 50\mu\text{A}$
		- 0.5	- 4	- 0.5	- 4	- 0.5	- 4	V	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	- 1	- 4.5	- 1	- 4.5	- 1	- 4.5	V	$V_{DS} = -20\text{V}$, $I_G = 1\text{nA}$
Gate Source Forward Voltage	$V_{GS(F)}$		2		2		2	V	$V_{DS} = \emptyset\text{V}$, $I_G = 1\text{mA}$
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	5	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	1000	3000	μS	$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$	$f = 1\text{kHz}$
		1000		1000		1000			μS	$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$
Common Source Output Capacitance	g_{os}		35		35		35	μS	$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$	$f = 1\text{kHz}$
Common Source Input Capacitance	C_{iss}		4		4		4	pF	$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$	$f = 1\text{MHz}$
Drain Gate Capacitance	C_{dgo}		1.5		1.5		1.5	pF	$V_{dg} = 10\text{V}$, $I_S = \emptyset\text{A}$	$f = 1\text{MHz}$
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2		1.2	pF	$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$	$f = 1\text{MHz}$
Noise Figure	NF		0.5		0.5		0.5	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		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}	0.95	1	0.95	1	0.95	1		$V_{DS} = 20\text{V}$, $V_{GS} = \emptyset\text{V}$	
Differential Gate Source Voltage	$ V_{GS1} - V_{GS2} $		5		10		15	mV	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$	
Differential Gate Source Voltage with Temperature	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		0.8		2		4	mV/°C	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$	$T_A = 25^\circ\text{C}$ to -55°C
			1		2.5		5	mV/°C	$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$	$T_A = 25^\circ\text{C}$ to $+125^\circ\text{C}$
Transconductance Ratio	g_{fs1}/g_{fs2}	0.97	1	0.97	1	0.97	1		$V_{DS} = 20\text{V}$, $I_D = 200\mu\text{A}$	$f = 1\text{kHz}$

TO-71 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source, 2 Drain, 3 Gate,
5 Source, 6 Drain, 7 Gate