

The 2N3954 is a Low Noise, Low Drift, Monolithic Dual N-Channel JFET

The 2N3954 family are matched JFET pairs for differential amplifiers. The 2N3954 family of general purpose JFETs is characterized for low and medium frequency differential amplifiers requiring low offset voltage, drift, noise and capacitance

The 2N3954 family also exhibits low capacitance - 6pF max and a spot noise figure of -0.5dB max. The part offers a superior tracking ability.

The hermetically sealed TO-71 and TO-78 packages are well suited for high reliability and harsh environment applications.

(See Packaging Information).

2N3954 Applications:

- Wideband Differential Amps
- High Input Impedance Amplifiers

FEATURES		
LOW DRIFT	$ \Delta V_{GS1-2} / \Delta T = 5\mu V/^{\circ}C$ max.	
LOW LEAKAGE	$I_G = 20pA$ TYP.	
LOW NOISE	$e_n = 10nV/\sqrt{Hz}$ TYP.	
ABSOLUTE MAXIMUM RATINGS @ 25°C (unless otherwise noted)		
Maximum Temperatures		
Storage Temperature	-65°C to +200°C	
Operating Junction Temperature	+150°C	
Maximum Voltage and Current for Each Transistor – Note 1		
-V _{GSS}	Gate Voltage to Drain or Source	60V
-V _{DSS}	Drain to Source Voltage	60V
-I _{G(f)}	Gate Forward Current	50mA
Maximum Power Dissipation		
Device Dissipation @ Free Air – Total	400mW @ 25°C	

MATCHING CHARACTERISTICS @ 25°C UNLESS OTHERWISE NOTED				
SYMBOL	CHARACTERISTICS	VALUE	UNITS	CONDITIONS
$ V_{GS1-2} / T $ max.	DRIFT VS. TEMPERATURE	10	$\mu V/^{\circ}C$	V _{DG} =20V, I _D =200 μA T _A =-55°C to +125°C
$ V_{GS1-2} $ max.	OFFSET VOLTAGE	5	mV	V _{DG} =20V, I _D =200 μA

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

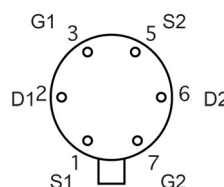
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV _{GSS}	Breakdown Voltage	60	--	--	V	V _{DS} = 0 I _D =1 μA
BV _{GGO}	Gate-To-Gate Breakdown	60	--	--	V	I _G = 1nA I _D = 0 I _S = 0
TRANSCONDUCTANCE						
Y _{FSS}	Full Conduction	1000	2000	3000	μmho	V _{DG} = 20V V _{GS} = 0V f = 1kHz
Y _{FS}	Typical Operation	500	700	1000	μmho	V _{DG} = 20V I _D = 200 μA
$ Y_{FS1-2} / Y_{FS} $	Mismatch	--	0.6	3	%	
DRAIN CURRENT						
I _{DSS}	Full Conduction	0.5	2	5	mA	V _{DG} = 20V V _{GS} = 0V
$ I_{DSS1-2} / I_{DSS} $	Mismatch at Full Conduction	--	1	5	%	
GATE VOLTAGE						
V _{GS(off)} or V _p	Pinchoff voltage	1	2	4.5	V	V _{DS} = 20V I _D = 1nA
V _{GS(on)}	Operating Range	0.5	--	4	V	V _{DS} =20V I _D =200 μA
GATE CURRENT						
-I _G	Operating	--	20	50	pA	V _{DG} = 20V I _D = 200 μA
-I _G	High Temperature	--	--	50	nA	T _A = +125°C
-I _G	Reduced V _{DG}	--	5	--	pA	V _{DG} = 10V I _D = 200 μA
-I _{GSS}	At Full Conduction	--	--	100	pA	V _{DG} = 20V V _{DS} = 0
OUTPUT CONDUCTANCE						
Y _{OSS}	Full Conduction	--	--	5	μmho	V _{DG} = 20V V _{GS} = 0V
Y _{OS}	Operating	--	0.1	1	μmho	V _{DG} = 20V I _D = 200 μA
$ Y_{OS1-2} $	Differential	--	0.01	0.1	μmho	
COMMON MODE REJECTION						
CMR	-20 log V _{GS1-2} /V _{DS}	--	100	--	dB	$\Delta V_{DS} = 10$ to 20V I _D =200 μA
CMR	-20 log V _{GS1-2} /V _{DS}	--	75	--	dB	$\Delta V_{DS} = 5$ to 10V I _D =200 μA
NOISE						
NF	Figure	--	--	0.5	dB	V _{DS} = 20V V _{GS} = 0V R _G = 10M Ω f= 100Hz NBW= 6Hz
e _n	Voltage	--	--	15	nV/ \sqrt{Hz}	V _{DS} =20V I _D =200 μA f=10Hz NBW=1Hz
CAPACITANCE						
C _{ISS}	Input	--	--	6	pF	V _{DS} = 20V V _{GS} = 0V f= 1MHz
C _{RSS}	Reverse Transfer	--	--	2	pF	
C _{DD}	Drain-to-Drain	--	0.1	--	pF	V _{DG} = 20V I _D = 200 μA

Note 1 – These ratings are limiting values above which the serviceability of any semiconductor may be impaired

Available Packages:

2N3954 in TO-71 / TO-78
2N3954 available as bare die
Please contact [Micross](http://www.micross.com) for full package and die dimensions

TO-71 / TO-78 (Bottom View)



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