

The 2N3956 is a Low Noise, Low Drift, Monolithic Dual N-Channel JFET

The 2N3956 family are matched JFET pairs for differential amplifiers. The 2N3956 family of general purpose JFETs is characterized for low and medium frequency differential amplifiers requiring low offset voltage, drift, noise and capacitance

The 2N3956 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).

2N3956 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
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MATCHING CHARACTERISTICS @ 25°C UNLESS OTHERWISE NOTED

SYMBOL	CHARACTERISTICS	VALUE	UNITS	CONDITIONS
$ V_{GS1-2} / T $ max.	DRIFT VS. TEMPERATURE	50	$\mu V/^{\circ}C$	V _{DG} =20V, I _D =200 μ A T _A =-55°C to +125°C
$ V_{GS1-2} $ max.	OFFSET VOLTAGE	15	mV	V _{DG} =20V, I _D =200 μ A

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

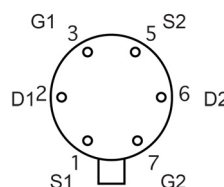
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV _{GSS}	Breakdown Voltage	60	--	--	V	V _{DS} = 0 I _D =1 μ A
BV _{GGO}	Gate-To-Gate Breakdown	60	--	--	V	I _G = 1nA I _D = 0 I _S = 0
TRANSCONDUCTANCE						
Y _{FSS}	Full Conduction	1000	2000	3000	μ mho	V _{DG} = 20V V _{GS} = 0V f = 1kHz
Y _{FS}	Typical Operation	500	700	1000	μ mho	V _{DG} = 20V I _D = 200 μ A
$ 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 μ A
GATE CURRENT						
-I _G	Operating	--	20	50	pA	V _{DG} = 20V I _D = 200 μ A
-I _G	High Temperature	--	--	50	nA	T _A = +125°C
-I _G	Reduced V _{DG}	--	5	--	pA	V _{DG} = 10V I _D = 200 μ A
-I _{GSS}	At Full Conduction	--	--	100	pA	V _{DG} = 20V V _{DS} = 0
OUTPUT CONDUCTANCE						
Y _{OSS}	Full Conduction	--	--	5	μ mho	V _{DG} = 20V V _{GS} = 0V
Y _{OS}	Operating	--	0.1	1	μ mho	V _{DG} = 20V I _D = 200 μ A
$ Y_{OS1-2} $	Differential	--	0.01	0.1	μ mho	
COMMON MODE REJECTION						
CMR	-20 log V _{GS1-2} /V _{DS}	--	100	--	dB	$\Delta V_{DS} = 10$ to 20V I _D =200 μ A
CMR	-20 log V _{GS1-2} /V _{DS}	--	75	--	dB	$\Delta V_{DS} = 5$ to 10V I _D =200 μ A
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 μ A 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 μ A

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

Available Packages:

2N3956 in TO-71 / TO-78
2N3956 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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