LINEAR SYSTEMS

2N3956
MONOLITHIC DUAL N-CHANNEL JFET

micross

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	$\|\Delta V_{GS1-2}/\Delta T\|$ = 5µV/°C max.
LOW LEAKAGE	I_G = 20pA TYP.
LOW NOISE	e_n = 10nV/√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
$-V_{DSO}$	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	50	µV/°C	V_{DG}=20V, I_D=200µA T_A=-55°C to +125°C
$\|V_{GS1-2}\|$ max.	OFFSET VOLTAGE	15	mV	V_{DG}=20V, I_D=200µA

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

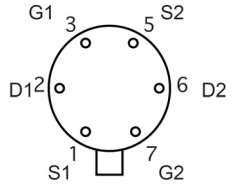
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV_{GSS}	Breakdown Voltage	60	--	--	V	V_{DS} = 0 I_D=1µA
BV_{GGO}	Gate-To-Gate Breakdown	60	--	--	V	I_G= 1nA I_D= 0 I_S= 0
	TRANSCONDUCTANCE					
Y_{fss}	Full Conduction	1000	2000	3000	µmho	V_{DG}= 20V V_{GS}= 0V f = 1kHz
Y_{fs}	Typical Operation	500	700	1000	µmho	V_{DG}= 20V I_D= 200µA
$\|Y_{FS1-2}/Y_{FS}\|$	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=200µA
	GATE CURRENT					
$-I_G$	Operating	--	20	50	pA	V_{DG}= 20V I_D= 200µA
$-I_G$	High Temperature	--	--	50	nA	T_A= +125°C
$-I_G$	Reduced V_{DG}	--	5	--	pA	V_{DG}= 10V I_D= 200µA
$-I_{GSS}$	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= 200µA
$\|Y_{OS1-2}\|$	Differential	--	0.01	0.1	µmho	
	COMMON MODE REJECTION					
CMR	-20 log $\|V_{GS1-2}/V_{DS}\|$	--	100	--	dB	ΔV_{DS} = 10 to 20V I_D=200µA
CMR	-20 log $\|V_{GS1-2}/V_{DS}\|$	--	75	--	dB	ΔV_{DS} = 5 to 10V I_D=200µA
	NOISE					V_{DS}= 20V V_{GS}= 0V R_G= 10MΩ
NF	Figure	--	--	0.5	dB	f= 100Hz NBW= 6Hz
e_n	Voltage	--	--	15	nV/√Hz	V_{DS}=20V I_D=200µA 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= 200µA

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 for full package and die dimensions

TO-71 / TO-78 (Bottom View)



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