

## The 2N3958 is a Low Noise, Low Drift, Monolithic Dual N-Channel JFET

The 2N3958 family are matched JFET pairs for differential amplifiers. The 2N3958 family of general purpose JFETs is characterized for low and medium frequency differential amplifiers requiring low offset voltage, drift, noise and capacitance

The 2N3958 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).

### 2N3958 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
$-V_{DSO}$	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	100	$\mu V/^{\circ}C$	$V_{DG}=20V, I_D=200\mu A$ $T_A=-55^{\circ}C$ to $+125^{\circ}C$
$ V_{GS1-2} $ max.	OFFSET VOLTAGE	25	mV	$V_{DG}=20V, I_D=200\mu A$

### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

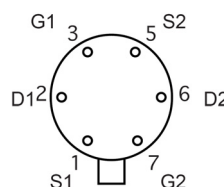
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$BV_{GSS}$	Breakdown Voltage	60	--	--	V	$V_{DS} = 0$ $I_D=1\mu A$
$BV_{GGO}$	Gate-To-Gate Breakdown	60	--	--	V	$I_G = 1nA$ $I_D = 0$ $I_S = 0$
<b>TRANSCONDUCTANCE</b>						
$Y_{fss}$	Full Conduction	1000	2000	3000	$\mu mho$	$V_{DG} = 20V$ $V_{GS} = 0V$ $f = 1kHz$
$Y_{fs}$	Typical Operation	500	700	1000	$\mu mho$	$V_{DG} = 20V$ $I_D = 200\mu A$
$ Y_{FS1-2} / Y_{FS} $	Mismatch	--	0.6	3	%	
<b>DRAIN CURRENT</b>						
$I_{DSS}$	Full Conduction	0.5	2	5	mA	$V_{DG} = 20V$ $V_{GS} = 0V$
$ I_{DSS1-2} / I_{DSS} $	Mismatch at Full Conduction	--	1	5	%	
<b>GATE VOLTAGE</b>						
$V_{GS(off)}$ 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	$V_{DS} = 20V$ $I_D = 200\mu A$
<b>GATE CURRENT</b>						
$-I_G$	Operating	--	20	50	pA	$V_{DG} = 20V$ $I_D = 200\mu A$
$-I_G$	High Temperature	--	--	50	nA	$T_A = +125^{\circ}C$
$-I_G$	Reduced $V_{DG}$	--	5	--	pA	$V_{DG} = 10V$ $I_D = 200\mu A$
$-I_{GSS}$	At Full Conduction	--	--	100	pA	$V_{DG} = 20V$ $V_{DS} = 0$
<b>OUTPUT CONDUCTANCE</b>						
$Y_{OSS}$	Full Conduction	--	--	5	$\mu mho$	$V_{DG} = 20V$ $V_{GS} = 0V$
$Y_{OS}$	Operating	--	0.1	1	$\mu mho$	$V_{DG} = 20V$ $I_D = 200\mu A$
$ Y_{OS1-2} $	Differential	--	0.01	0.1	$\mu mho$	
<b>COMMON MODE REJECTION</b>						
CMR	$-20 \log  V_{GS1-2} / V_{DS} $	--	100	--	dB	$\Delta V_{DS} = 10$ to $20V$ $I_D = 200\mu A$
CMR	$-20 \log  V_{GS1-2} / V_{DS} $	--	75	--	dB	$\Delta V_{DS} = 5$ to $10V$ $I_D = 200\mu A$
<b>NOISE</b>						
NF	Figure	--	--	0.5	dB	$V_{DS} = 20V$ $V_{GS} = 0V$ $R_G = 10M\Omega$ $f = 100Hz$ $NBW = 6Hz$
$e_n$	Voltage	--	--	15	nV/ $\sqrt{Hz}$	$V_{DS} = 20V$ $I_D = 200\mu A$ $f = 10Hz$ $NBW = 1Hz$
<b>CAPACITANCE</b>						
$C_{ISS}$	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	$V_{DG} = 20V$ $I_D = 200\mu A$

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

### Available Packages:

2N3958 in TO-71 / TO-78  
2N3958 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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