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2N5196 2N5197 2N5198 2N5199

monolithic dual n-channel JFETs designed for . . .

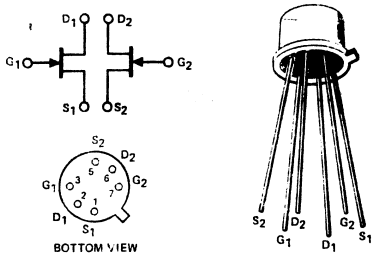
- **Differential Amplifiers**
- **FET Input Op Amps**

Performance Curves NNP See Section 4

BENEFITS

- Minimum System Error and Calibration
  5 mV Maximum Offset (2N5196, 97)
- Low Drift
  5 μV/°C Maximum (2N5196)
- Simplifies Amplifier Design
  Low Output Conductance

TO-71
See Section 5



*ABSOLUTE MAXIMUM RATINGS (25°C)

Gate-Drain or Gate-Source Voltage . . . . . -50 V
Gate Current . . . . . 50 mA
Device Dissipation (Each Side), T_A = 85°C
(Derate 2.56 mW/°C) . . . . . 250 mW
Total Device Dissipation, T_A = 85°C
(Derate 4.3 mW/°C) . . . . . 500 mW
Storage Temperature Range . . . . . -65 to +200°C

*ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

		Characteristic		Min	Max	Unit	Test Conditions	
1	STATIC	I_{GSS}	Gate Reverse Current		-25	pA	V_{GS} = -30 V, V_{DS} = 0	
2					-50	nA		150°C
3		BV_{GSS}	Gate-Source Breakdown Voltage	-50		V	I_G = -1 μA, V_{DS} = 0	
4		$V_{GS(off)}$	Gate-Source Cutoff Voltage	-0.7	-4		V_{DS} = 20 V, I_D = 1 nA	
5		V_{GS}	Gate-Source Voltage	-0.2	-3.8			
6		I_G	Gate Operating Current		-15	pA	V_{DG} = 20 V, I_D = 200 μA	
					-15	nA		125°C
7		I_{DSS}	Saturation Drain Current	0.7	7	mA	V_{DS} = 20 V, V_{GS} = 0	
8	DYNAMIC	g_{fs}	Common-Source Forward Transconductance	1000	4000	μmho	V_{DS} = 20 V, V_{GS} = 0	f = 1 kHz
9		g_{fs}	Common-Source Forward Transconductance	700	1600		V_{DG} = 20 V, I_D = 200 μA	
10		g_{os}	Common-Source Output Conductance		50		V_{DS} = 20 V, V_{GS} = 0	
11		g_{os}	Common-Source Output Conductance		4		V_{DG} = 20 V, I_D = 200 μA	
12		C_{iss}	Common-Source Input Capacitance		6	pF	V_{DS} = 20 V, V_{GS} = 0	f = 1 MHz
13		C_{rss}	Common-Source Reverse Transfer Capacitance		2			
14		NF	Spot Noise Figure		0.5	dB		f = 100 Hz, R_G = 10 MΩ
15		$\bar{e}_n$	Equivalent Short-Circuit Input Noise Voltage		20	$\frac{nV}{\sqrt{Hz}}$		f = 1 kHz

		Characteristic		2N5196		2N5197		2N5198		2N5199		Unit	Test Conditions	
				Min	Max	Min	Max	Min	Max	Min	Max			
16	MATCHING	$\lvert I_{G1}-I_{G2}\rvert$	Differential Gate Current		5		5		5		5	nA	V_{DG} = 20 V, I_D = 200 μA	125°C
17		$\frac{I_{DSS1}}{I_{DSS2}}$	Saturation Drain Current Ratio (Note 1)	0.95	1	0.95	1	0.95	1	0.95	1	–	V_{DS} = 20 V, V_{GS} = 0 V	
18		$\frac{g_{fs1}}{g_{fs2}}$	Transconductance Ratio (Note 1)	0.97	1	0.97	1	0.95	1	0.95	1	–	V_{DG} = 20 V, I_D = 200 μA	f = 1 kHz
19		$\lvert V_{GS1}-V_{GS2}\rvert$	Differential Gate-Source Voltage		5		5		10		15	mV		
20		$\frac{\Delta\lvert V_{GS1}-V_{GS2}\rvert}{\Delta T}$	Gate-Source Differential Voltage Change with Temperature (Note 2)		5		10		20		40	μV/°C		T_A = 25°C T_B = 125°C
21					5		10		20		40			T_A = -55°C T_B = 25°C
22		$\lvert g_{os1}-g_{os2}\rvert$	Differential Output Conductance		1		1		1		1	μmho		f = 1 kHz

*JEDEC registered data.

NOTES:
1. Assumes smaller value in numerator.
2. Measured at end points, T_A and T_B.

NNP

Quality Semi-Conductors