

## 2N2979

### DUAL NPN LOW LEVEL LOW NOISE DIFFERENTIAL AMPLIFIER

#### ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures	-65°C to +200°C
Storage Temperature	200°C
Operating Junction Temperature	300°C
Lead Temperature (60 seconds)	
Maximum Power Dissipation (Notes 2 & 3)	

Total Dissipation at 25°C Case Temperature at 100°C Case Temperature at 25°C Ambient Temperature	One Side	Both Sides
	0.5 W	0.75 W
	0.29 W	0.43 W
	0.25 W	0.3 W

Maximum Voltages and Current		
V <sub>CB0</sub>	Collector to Base Voltage	60 V
V <sub>CE0</sub>	Collector to Emitter Voltage (Note 4)	60 V
V <sub>EB0</sub>	Emitter to Base Voltage	6.0 V
I <sub>C</sub>	Collector Current	30 mA

#### MATCHING AND ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
$\frac{h_{FE1}}{h_{FE2}}$	DC Current Gain Ratio (Note 5)	0.9	1.0		I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V I <sub>C</sub> = 100 μA to 1.0 mA, V <sub>CE</sub> = 5.0 V, T <sub>A</sub> = 55°C to +125°C
V <sub>BE1</sub> -V <sub>BE2</sub>	Base to Emitter Voltage Differential (Note 6)		5.0	mV	I <sub>C</sub> = 10 μA to 1.0 mA, V <sub>CE</sub> = 5.0 V
Δ(V <sub>BE1</sub> -V <sub>BE2</sub> )	Base to Emitter Voltage Differential Change		0.8	mV	I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V
			(10 μV/°C)		T <sub>A</sub> = -55°C to +25°C
h <sub>fe</sub>	High Frequency Current Gain	3.0	1.0	mV	I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V, T <sub>A</sub> = 25°C to +125°C
			(10 μV/°C)		I <sub>C</sub> = 0.5 mA, V <sub>CE</sub> = 5.0 V, f = 20 MHz

#### ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted) (Cont'd)

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
h <sub>FE</sub>	DC Current Gain	300	225		I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 V
		150	600		I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V
	2N2918A, 2N2920A only	40			I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V T <sub>A</sub> = -55°C
V <sub>CE(sat)</sub>	Collector Saturation Voltage		0.35	V	I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0.1 mA
V <sub>BE(ON)</sub>	Emitter to Base "On" Voltage		0.7	V	I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 5.0 V
I <sub>CB0</sub>	Collector Cutoff Current		2.0	nA	I <sub>E</sub> = 0, V <sub>CB</sub> = 45 V
			10	μA	I <sub>E</sub> = 0, V <sub>CB</sub> = 45 V, T <sub>A</sub> = 150°C
I <sub>CEO</sub>	Collector Cutoff Current		2.0	nA	I <sub>B</sub> = 0, V <sub>CE</sub> = 5.0 V
I <sub>EBO</sub>	Emitter Cutoff Current		2.0	nA	I <sub>C</sub> = 0, V <sub>EB</sub> = 5.0 V
C <sub>ob</sub>	Output Capacitance		8.0	pF	I <sub>E</sub> = 0, V <sub>CB</sub> = 5.0 V, f = 140 kHz
h <sub>ib</sub>	Input Resistance	25	32	Ω	I <sub>C</sub> = 1.0 mA, V <sub>CB</sub> = 5.0 V, f = 1.0 kHz
h <sub>ob</sub>	Output Conductance		1.0	μmhos	I <sub>C</sub> = 1.0 mA, V <sub>CB</sub> = 5.0 V, f = 1.0 kHz
BV <sub>CB0</sub>	Collector to Base Breakdown Voltage	60		V	I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0
V <sub>CEO(sus)</sub>	Collector to Emitter Sustaining Voltage (Pulsed) (Notes 4 & 7)	60		V	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0
BV <sub>EB0</sub>	Emitter to Base Breakdown Voltage	6.0		V	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0
NF	Wide Band Noise Figure		3.0	dB	I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V, f = 10 Hz to 10 kHz, PBW = 15.7 Hz, R <sub>S</sub> = 10 kΩ
NF	Narrow Band Noise Figure		3.0	dB	I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V, f = 1.0 kHz, PBW = 200 Hz, R <sub>C</sub> = 10 kΩ

