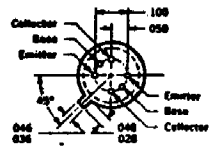
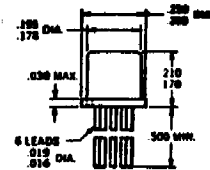


**2N2913 • 2N2914 • 2N2972 • 2N2973**  
 DUAL NPN LOW LEVEL LOW NOISE DIFFERENTIAL AMPLIFIERS  
 DIFFUSED SILICON PLANAR\* TRANSISTORS

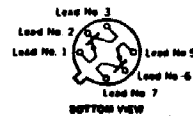
- NF ... 4.0 dB (MAX) (2N2913/2N2972)
- V<sub>CEO</sub> ... 45 V (MIN)

**ABSOLUTE MAXIMUM RATINGS (Note 1)**

Maximum Temperatures	-65°C to +200°C			
Storage Temperature	-65°C to +200°C			
Operating Junction Temperature	200°C			
Lead Temperature (80 seconds)	300°C			
Maximum Power Dissipation (Notes 2 & 3)	2N2913	2N2914	2N2972	2N2973
	One Side	Both Sides	One Side	Both Sides
Total Dissipation				
at 25°C Case Temperature	0.75 W	1.5 W	0.5 W	0.75 W
at 100°C Case Temperature	0.43 W	0.86 W	0.29 W	0.43 W
at 25°C Ambient Temperature	0.3 W	0.5 W	0.25 W	0.30 W
Maximum Voltages and Current				
V <sub>CB0</sub> Collector to Base Voltage	45 V			
V <sub>CEO</sub> Collector to Emitter Voltage (Note 4)	45 V			
V <sub>EBO</sub> Emitter to Base Voltage	6.0 V			
I <sub>C</sub> Collector Current	30 mA			



**CONNECTION DIAGRAM**



NOTES: An dimensions in inches. Leads are gold plated. Package weight: 0.02 gram.

**ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted)**

SYMBOL	CHARACTERISTIC	2N2913		2N2914		UNITS	TEST CONDITIONS
		2N2972	MAX.	2N2973	MAX.		
V <sub>CE(sat)</sub>	Collector Saturation Voltage		0.35		0.35	V	I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0.1 mA
I <sub>CBO</sub>	Collector Cutoff Current		10		10	nA	I <sub>E</sub> = 0, V <sub>CB</sub> = 45 V
V <sub>CEO(sus)</sub>	Collector to Emitter Sustaining Voltage (Note 5)	45		45		V	I <sub>E</sub> = 0, V <sub>CB</sub> = 45 V, T <sub>A</sub> = 150°C
NF	Narrow Band Noise Figure		4.0		3.0	dB	I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V, f = 1 kHz, R <sub>S</sub> = 10 kΩ, Bandwidth = 200 Hz
NF	Wide Band Noise Figure		4.0		3.0	dB	I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V, R <sub>S</sub> = 10 kΩ, f = 10-Hz to 10 kHz, Bandwidth of 15.7 kHz
h <sub>FE</sub>	DC Current Gain	60	240	150	600		I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V
		150		300			I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 V
		100		225			I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V
		15		30			I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V, T <sub>A</sub> = -55°C
V <sub>BE(ON)</sub>	Emitter to Base "On" Voltage		0.7		0.7	V	I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 5.0 V
I <sub>CEO</sub>	Collector Cutoff Current		2.0		2.0	nA	I <sub>B</sub> = 0, V <sub>CE</sub> = 5.0 V
I <sub>EBO</sub>	Emitter Cutoff Current		2.0		2.0	nA	I <sub>C</sub> = 0, V <sub>EB</sub> = 5.0 V
h <sub>fe</sub>	High Frequency Current Gain	3.0		3.0			I <sub>C</sub> = 0.5 mA, V <sub>CE</sub> = 5.0 V, f = 20 MHz
C <sub>ob</sub>	Output Capacitance		6.0		6.0	pF	I <sub>E</sub> = 0, V <sub>CB</sub> = 5.0 V, f = 140 kHz
h <sub>ib</sub>	Input Resistance	25	32	25	32	Ω	I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 V, f = 1.0 kHz
h <sub>ob</sub>	Output Conductance		1.0		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	45		45		V	I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0
BV <sub>EBO</sub>	Emitter to Base Breakdown Voltage	6.0		6.0		V	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0

**NOTES:**

1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. These ratings give a maximum junction temperature of 200°C and junction to ambient thermal resistance of 584°C/W (derating factor of 1.71 mW/°C) for one side; 350°C/W (derating factor of 2.86 mW/°C) for both sides for the 2N2913 and 2N2914. For the 2N2972 and 2N2973, junction to ambient thermal resistance is 700°C/W (derating factor of 1.43 mW/°C) for one side; 584°C/W (derating factor of 1.71 mW/°C) for both sides.
4. Rating refers to a high current point where collector to emitter voltage is lowest.
5. Pulse conditions: length = 300μs; duty cycle = 1%.
6. For product family characteristic curves, refer to Section 5 - 558.

\*Planar is a patented Fairchild process.

