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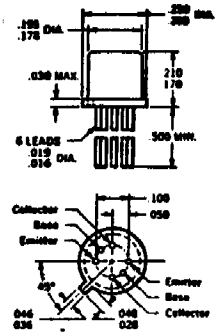
2N2913 • 2N2914 • 2N2972 • 2N2973

DUAL NPN LOW LEVEL LOW NOISE DIFFERENTIAL AMPLIFIERS

DIFFUSED SILICON PLANAR* TRANSISTORS

- NF . . . 4.0 dB (MAX) (2N2913/2N2972)
- V_{CEO} . . . 45 V (MIN)

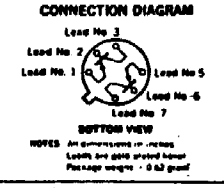


ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures				
Storage Temperature				−65°C to +200°C
Operating Junction Temperature				200°C
Lead Temperature (60 seconds)				300°C
Maximum Power Dissipation (Notes 2 & 3)	2N2913 2N2914 One Side	2N2913 2N2914 Both Sides	2N2972 2N2973 One Side	2N2972 2N2973 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_{CBO}	Collector to Base Voltage	45 V
V_{CEO}	Collector to Emitter Voltage (Note 4)	45 V
V_{EBO}	Emitter to Base Voltage	6.0 V
I_C	Collector Current	30 mA

CONNECTION DIAGRAM



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

SYMBOL	CHARACTERISTIC	2N2913 2N2972 MIN.	2N2913 2N2972 MAX.	2N2914 2N2973 MIN.	2N2914 2N2973 MAX.	UNITS	TEST CONDITIONS
$V_{CE(sat)}$	Collector Saturation Voltage		0.35		0.35	V	I_C = 1.0 mA, I_B = 0.1 mA
I_{CBO}	Collector Cutoff Current		10		10	nA	I_E = 0, V_{CB} = 45 V
			10		10	μA	I_E = 0, V_{CB} = 45 V, T_A = 150°C
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 5)	45		45		V	I_C = 10 mA, I_B = 0 (pulsed)
NF	Narrow Band Noise Figure		4.0		3.0	dB	I_C = 10 μA, V_{CE} = 5.0 V, f = 1 kHz, R_S = 10 kΩ, Bandwidth = 200 Hz
NF	Wide Band Noise Figure		4.0		3.0	dB	I_C = 10 μA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 10 Hz to 10 kHz, Bandwidth of 15.7 kHz
h_{FE}	DC Current Gain	60	240	150	600		I_C = 10 μA, V_{CE} = 5.0 V
		150		300			I_C = 1.0 mA, V_{CE} = 5.0 V
		100		225			I_C = 100 μA, V_{CE} = 5.0 V
		15		30			I_C = 10 μA, V_{CE} = 5.0 V, T_A = −55°C
$V_{BE(ON)}$	Emitter to Base "On" Voltage		0.7		0.7	V	I_C = 0.1 mA, V_{CE} = 5.0 V
I_{CEO}	Collector Cutoff Current		2.0		2.0	nA	I_B = 0, V_{CE} = 5.0 V
I_{EBO}	Emitter Cutoff Current		2.0		2.0	nA	I_C = 0, V_{EB} = 5.0 V
h_{fe}	High Frequency Current Gain	3.0		3.0			I_C = 0.5 mA, V_{CE} = 5.0 V, f = 20 MHz
C_{ob}	Output Capacitance		6.0		6.0	pF	I_E = 0, V_{CB} = 5.0 V, f = 140 kHz
h_{ib}	Input Resistance	25	32	25	32	Ω	I_C = 1.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz
h_{ob}	Output Conductance		1.0		1.0	μmhos	I_C = 1.0 mA, V_{CB} = 5.0 V, f = 1.0 kHz
BV_{CBO}	Collector to Base Breakdown Voltage	45		45		V	I_C = 10 μA, I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	6.0		6.0		V	I_E = 10 μA, I_C = 0

NOTES:

*Planar is a patented Fairchild process

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 — SS8.