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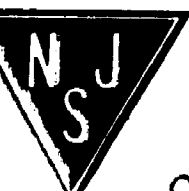
2N3424

DUAL NPN LOW NOISE SENSE AND HIGH FREQUENCY DIFFERENTIAL AMPLIFIER

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)		
	One Side	Both Sides
Total Dissipation at 25°C Case Temperature	0.6 W	1.2 W
at 100°C Case Temperature	0.25 W	0.5 W
at 25°C Ambient Temperature	0.3 W	0.45 W
Maximum Voltages and Current		
V _{CB0}	Collector to Base Voltage	30 V
V _{CE0}	Collector to Emitter Voltage (Note 4)	15 V
V _{EB0}	Emitter to Base Voltage	3.0 V
I _C	Collector Current	50 mA
V _{C1C2}	Collector ₁ to Collector ₂ Voltage	±200 V
	Voltage Rating Any Lead to Case	±200 V

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

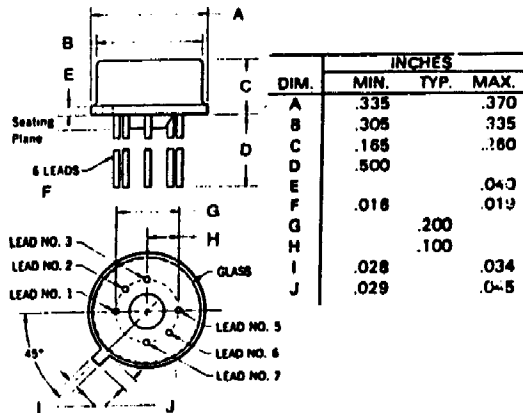
SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
V _{CE(sat)}	Collector Saturation Voltage		0.4	V	I _C = 10 mA, I _B = 1.0 mA
V _{BE(sat)}	Base Saturation Voltage		1.0	V	I _C = 10 mA, I _B = 1.0 mA
I _{CBO}	Collector Cutoff Current		10	nA	I _E = 0, V _{CB} = 15 V
I _{EB0}	Emitter Cutoff Current		1.0	μA	I _E = 0, V _{CB} = 15 V, T _A = 150°C
h _{fe}	High Frequency Current Gain	6.0	10	μA	I _C = 0, V _{EB} = 3.0 V
C _{ob}	Common to Base Output Capacitance		1.7	pF	I _E = 0, V _{CB} = 10 V, f = 100 MHz
C _{ib}	Common to Base Input Capacitance		3.0	pF	I _E = 0, V _{CB} = 0, f = 140 kHz
RE(hie)	Real Part of Common Emitter Input Impedance		2.0	pF	I _C = 0, V _{EB} = 0.5 V, f = 140 kHz
NF	Noise Figure	3.5 (TYP)		Ω	I _C = 3.0 mA, V _{CE} = 3.0 V, f = 350 MHz
				dB	i _C = 1.0 mA, V _{CE} = 6.0 V, f = 60 MHz



NJ Semi-Conductors reserves the right to change test conditions, parameters limits and package dimensions without notice information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

JEDEC (TO-78) outline



NOTES: See table for dimensions in inches and millimeters
 Leads 4 and 8 are omitted
 Lead No. 1 internally connected to one island
 Lead No. 7 internally connected to other island
 Leads are gold-plated kovar
 Kovar island thickness = 15 mils
 Package weight is 1.08 grams
 *Dimensions similar to JEDEC TO-78 except for lead length

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

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
h_{FE1} h_{FE2}	DC Current Gain Ratio (Note 5)	0.9	1.0		$I_C = 3.0 \text{ mA}, V_{CE} = 3.0 \text{ V}$
$ V_{BE1} - V_{BE2} $	Base to Emitter Voltage Differential		5.0	mV	$I_C = 3.0 \text{ mA}, V_{CE} = 3.0 \text{ V}$
$ \Delta(V_{BE1} - V_{BE2}) $	Base to Emitter Voltage Differential Change		1.6 (20 $\mu\text{V}/^\circ\text{C}$)	mV	$I_C = 3.0 \text{ mA}, V_{CE} = 3.0 \text{ V},$ $T_A = -55^\circ\text{C to } +25^\circ\text{C}$
$ \Delta(V_{BE1} - V_{BE2}) $	Base to Emitter Voltage Differential Change		2.0 (20 $\mu\text{V}/^\circ\text{C}$)	mV	$I_C = 3.0 \text{ mA}, V_{CE} = 3.0 \text{ V},$ $T_A = +25^\circ\text{C to } +125^\circ\text{C}$

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

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
h_{FE}	DC Current Gain	20	200		$I_C = 3.0 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 3.0 \text{ mA}, V_{CE} = 3.0 \text{ V}$
BV_{CBO}	Collector to Base Breakdown Voltage	30		V	$I_C = 1.0 \mu\text{A}, I_E = 0$
BV_{EBO}	Emitter to Base Breakdown Voltage	3.0		V	$I_C = 0, I_E = 10 \mu\text{A}$
$V_{CE0(sus)}$	Collector to Emitter Sustaining Voltage	15		V	$I_C = 3.0 \text{ mA}, I_B = 0$

NOTES:

- These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- These ratings give a maximum junction temperature of 200°C and junction to ambient thermal resistance of 584°C/W (derating factor of 1.72 mW/°C) for one side; 389°C/W (derating factor of 2.57 mW/°C) for both sides; junction to case thermal resistance 290°C/W (derating factor of 3.44 mW/°C) for one side; 145°C/W (derating factor of 6.85 mW/°C) for both sides.
- Rating refers to a high current point where collector to emitter voltage is lowest.
- Lowest of two h_{FE} readings is taken as h_{FE1} for purpose of this ratio.
- Pulse conditions: length = 300 μs ; duty cycle = 1%.