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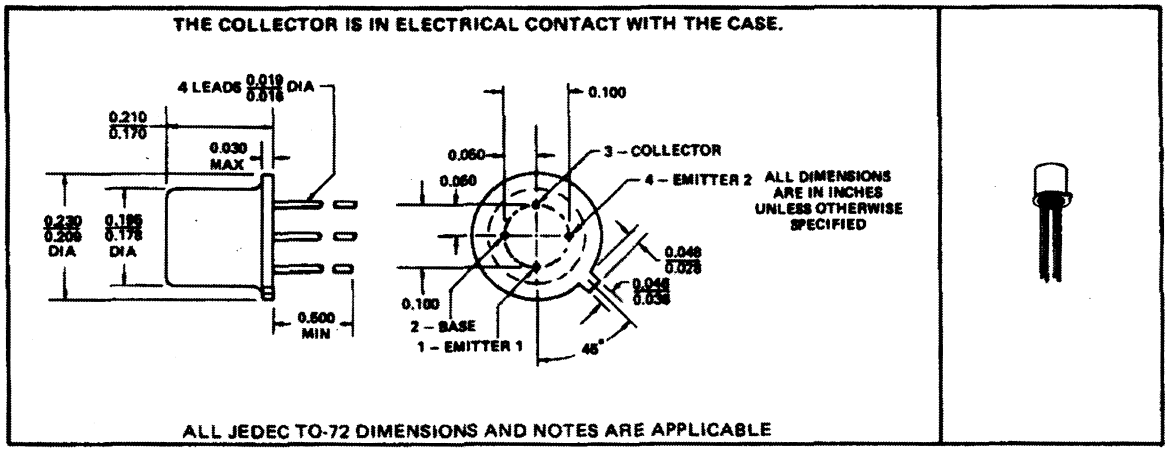
TYPES 3N74 THRU 3N79
N-P-N SILICON TRANSISTORS

DOUBLE-EMITTER TRANSISTORS
DESIGNED FOR CHOPPER APPLICATIONS

- **Low Offset Voltage**
- **Excellent Thermal Stability**
- **Very Low Leakage . . . 2 nA max at 15 V (3N74, 3N75, 3N76)**
- **High Breakdown Voltage . . . 18 V min (3N74, 3N75, 3N76)**

***mechanical data**



***absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)**

	3N74 3N75 3N76	3N77 3N78 3N79
Collector-Base Voltage	50 V	40 V
Emitter-One–Collector Voltage (See Note 1)	18 V	12 V
Emitter-Two–Collector Voltage (See Note 1)	18 V	12 V
Emitter-One–Emitter-Two Voltage (See Note 2)	±18 V	±12 V
Emitter-One–Base Voltage	18 V	12 V
Emitter-Two–Base Voltage	18 V	12 V
Continuous Collector Current	±20 mA	
Continuous Base Current	±20 mA	
Continuous Emitter-One Current	±10 mA	
Continuous Emitter-Two Current	±10 mA	
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 3)	300 mW	
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 4)	600 mW	
Storage Temperature Range	−65°C to 200°C	
Lead Temperature 1/16 Inch from Case for 10 Seconds	230°C	

NOTES: 1. These values apply when the base and other emitter are open-circuited.
2. These values apply when the collector is short-circuited to the base but open-circuited with respect to the emitters.
3. Derate linearly to 175°C free-air temperature at the rate of 2 mW/°C.
4. Derate linearly to 175°C case temperature at the rate of 4 mW/°C.

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

Quality Semi-Conductors

*electrical characteristics at 25°C free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS			3N77		3N78		3N79		UNIT
					MIN	MAX	MIN	MAX	MIN	MAX	
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 100 μA,	$I_{E1} = I_{E2} = 0$		40		40		40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 μA,	I_C = 0,	See Note 5	12		12		12		V
$V_{(BR)E1E2}$	Emitter-Emitter Breakdown Voltage	I_{E1} = ±10 μA,	V_{CB} = 0,	See Note 6	±12		±12		±12		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 30 V,	$I_{E1} = I_{E2} = 0$			10		10		20	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 5 V,	I_C = 0,	See Note 5		5		5		10	nA
$I_{E1E2(off)}$	Emitter Cutoff Current	V_{E1E2} = ±5 V,	V_{CB} = 0,	See Note 6		±5		±5		±10	nA
		V_{E1E2} = ±5 V,	V_{CB} = 0,	T_A = 100°C, See Note 6		±100		±100		±200	
$\lvert V_{E1E2(ofs)} \rvert$	Emitter-Emitter Offset Voltage	I_B = 1 mA, T_A = −25°C, 25°C, and 100°C	$I_{E1} = I_{E2}$ = 0,	See Figure 1,		50		100		200	μV
$\lvert \Delta V_{E1E2(ofs)} \rvert \lvert \Delta I_B \rvert$	Offset Voltage Change with Base Current†	$I_{B(1)}$ = 1.5 mA,	$I_{B(2)}$ = 0.5 mA,	$I_{E1} = I_{E2}$ = 0		25		50		75	μV
$\lvert \Delta V_{E1E2(ofs)} \rvert \lvert \Delta T_A \rvert$	Offset Voltage Change with Temperature†	I_B = 1 mA,	$I_{E1} = I_{E2}$ = 0,	$T_{A(1)}$ = 100°C, $T_{A(2)}$ = −25°C		75		125		175	μV
$r_{e1e2(on)}$	Small-Signal Emitter-Emitter On-State Resistance	I_B = 1 mA, f = 1 kHz,	$I_{E1} = I_{E2}$ = 0,	I_e = 100 μA, See Figure 2	10	50	10	50	10	60	Ω
$\lvert h_{fe} \rvert$	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 5 V,	I_C = 1 mA,	f = 20 MHz, See Note 5	1.5		1.5		1.5		
C_{obo}	Common-Base Open-Circuit Output Capacitance	V_{CB} = 5 V,	$I_{E1} = I_{E2}$ = 0,	f = 140 kHz		8		8		10	pF
C_{ibo}	Common-Base Open-Circuit Input Capacitance	V_{EB} = 5 V,	I_C = 0,	f = 140 kHz, See Note 5		5		5		6	pF

NOTES: 5. These limits apply separately for each emitter with the other emitter open-circuited.
6. These parameters must be measured with the collector short-circuited to the base but open-circuited with respect to the emitters. The limits apply to both polarities of emitter-to-emitter voltage.

†Offset Voltage Change is defined as the magnitude of the algebraic difference between the offset voltages at two specified base currents or temperatures.

PARAMETER MEASUREMENT INFORMATION

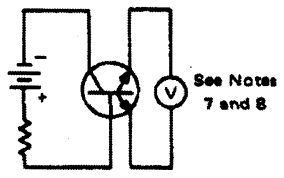
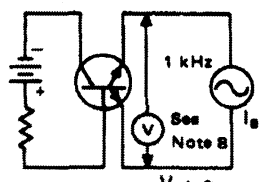


FIGURE 1



$$r_{e1e2(on)} = \frac{V_{e1e2}}{I_e}$$

FIGURE 2

NOTES: 7. Care must be taken to avoid error due to thermocouple action.
8. The voltmeter impedance must be high enough that halving it does not change the measured value.

*JEDEC registered data