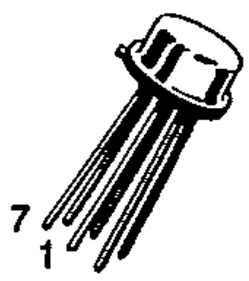
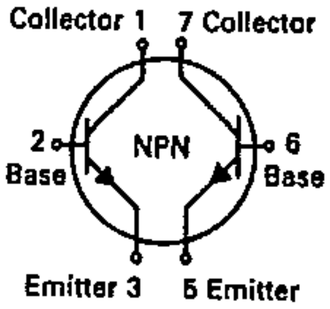
2N2639 thru 2N2644

CASE 654-07, STYLE 1





DUAL AMPLIFIER TRANSISTORS

NPN SILICON

Refer to 2N2913 for graphs.

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V_{CEO}	45		Vdc
Collector-Base Voltage	V_{CBO}	45		Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	30		mAdc
		One Die	Both Die	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	300 1.72	600 3.43	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	600 3.43	1200 6.87	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage(1) (I_C = 10 mAdc, I_B = 0)		$V_{CEO(sus)}$	45	—	Vdc
Collector Cutoff Current (V_{CE} = 5.0 Vdc, I_B = 0)		I_{CEO}	—	0.010	μAdc
Collector Cutoff Current (V_{CB} = 45 Vdc, I_E = 0) (V_{CB} = 45 Vdc, I_E = 0, T_A = +150°C)		I_{CBO}	— —	0.010 10	μAdc
Emitter Cutoff Current (V_{EB} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	0.010	μAdc
ON CHARACTERISTICS(1)					
DC Current Gain (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N2639, 2N2640, 2N2641 2N2642, 2N2643, 2N2644	h_{FE}	 50 100	 300 300	—
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N2639, 2N2640, 2N2641 2N2642, 2N2643, 2N2644		10 20	— —	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N2639, 2N2640, 2N2641 2N2642, 2N2643, 2N2644		55 110	— —	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N2639, 2N2640, 2N2641 2N2642, 2N2643, 2N2644		65 130	— —	
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 0.5 mAdc)		$V_{CE(sat)}$	—	1.0	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 0.5 mAdc)		$V_{BE(sat)}$	0.6	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 20 MHz)		f_T	40	—	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 1.0 MHz)		C_{obo}	—	8.0	pF
Input Impedance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz, I_E = −1.0 mA)		h_{ib}	25	32	ohms
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz, I_E = −1.0 mA)		h_{rb}	—	600	X 10^{-6}

2N2639 thru 2N2644

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)	2N2639, 2N2640, 2N2641 2N2642, 2N2643, 2N2644	h_{fe}	 65 130	 600 600	—
Output Admittance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz, I_E = −1.0 mA)		h_{ob}	—	1.0	μmhos
Noise Figure (I_C = 10 μAdc, V_{CB} = 5.0 Vdc, R_S = 10 kΩ, Bandwidth = 10 Hz to 15 kHz)		NF	—	4.0	dB
MATCHING CHARACTERISTICS					
DC Current Gain Ratio(2) (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N2639, 2N2642 2N2640, 2N2643	h_{FE1}/h_{FE2}	 0.9 0.8	 1.0 1.0	—
Base-Emitter Voltage Differential (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N2639, 2N2642 2N2640, 2N2643	$\lvert V_{BE1}-V_{BE2}\rvert$	 — —	 5.0 10	mVdc
Base-Emitter Voltage Differential Gradient (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55 to +125°C)	2N2639, 2N2642 2N2640, 2N2643	$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$	 — —	 10 20	μV/°C

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) The lowest h_{FE} reading is taken as h_{FE1} for this test.