2N3043 thru 2N3048

CASE 610A-04, STYLE 1

DUAL AMPLIFIER TRANSISTOR

NPN SILICON

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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	250 1.67	350 2.33	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	0.7 4.67	1.4 9.33	Watts 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 Breakdown Voltage(1) (I_C = 10 mAdc, I_B = 0)		$V_{(BR)CEO}$	45	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	Vdc
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} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	0.010	μAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3043, 2N3044, 2N3045 2N3046, 2N3047, 2N3048	h_{FE}	 100 50	 300 200	—
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N3043, 2N3044, 2N3045 2N3046, 2N3047, 2N3048		 130 65	 — —	
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 0.5 mAdc)		$V_{CE(sat)}$	—	1.0	Vdc
Base-Emitter On Voltage (I_C = 10 mAdc, V_{CE} = 5.0 Vdc)		V_{BE}	0.6	0.8	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 20 MHz)		f_T	30	—	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_{CE} = 5.0 Vdc, f = 1.0 kHz)	2N3043, 2N3044, 2N3045 2N3046, 2N3047, 2N3048	h_{ie}	 3.2k 1.6k	 19k 13k	Ohms
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	2N3043, 2N3044, 2N3045 2N3046, 2N3047, 2N3048	h_{fe}	 130 65	 600 400	—
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)		h_{oe}	 — —	 100 70	μmhos
Noise Figure (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 kohms, Bandwidth = 10 Hz to 15.7 kHz)		NF	—	5.0	dB

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

Characteristic		Symbol	Min	Max	Unit
MATCHING CHARACTERISTICS					
DC Current Gain Ratio(2) (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3043, 2N3046 2N3044, 2N3047	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)	2N3043, 2N3046 2N3044, 2N3047	$\lvert V_{BE1}-V_{BE2}\rvert$	 — —	 5.0 10	mVdc
Base-Emitter Voltage Differential Temperature Gradient (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55 to +125°C)	2N3043, 2N3046 2N3044, 2N3047	$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$	 — —	 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.

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