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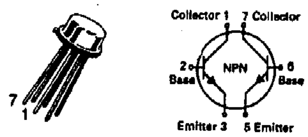
2N2453, A



DUAL AMPLIFIER TRANSISTORS

NPN SILICON

Refer to 2N2920 for graphs.

MAXIMUM RATINGS

Rating	Symbol	2N2453	2N2453A	Unit
Collector-Emitter Voltage	V_{CEO}	30	50	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current — Continuous	I_C	50		mAdc
		One Die	Both Die	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	200 1.14	300 1.71	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	600 3.43	1200 6.86	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)	 2N2453 2N2453A	$V_{CEO(sus)}$	 30 50	 — —	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	 2N2453 2N2453A	$V_{(BR)CBO}$	 60 80	 — —	Vdc
Emitter-Base Breakdown Voltage (I_E = 0.1 μAdc, I_C = 0)		$V_{(BR)EBO}$	7.0	—	Vdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0) (V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)		I_{CBO}	 — —	 0.005 10	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	0.002	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 10 μAdc, V_{CE} = 5.0 Vdc) (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C) (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc) (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)		h_{FE}	 80 40 150 75	 — — 600 —	—
Collector-Emitter Saturation Voltage (I_C = 5.0 mAdc, I_B = 0.5 mAdc)		$V_{CE(sat)}$	—	1.0	Vdc
Base-Emitter Saturation Voltage (I_C = 5.0 mAdc, I_B = 0.5 mAdc)		$V_{BE(sat)}$	—	0.9	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 5.0 mAdc, V_{CE} = 10 Vdc, f = 30 MHz)		f_T	60	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 140 kHz)		C_{obo}	—	8.0	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 140 kHz)		C_{ibo}	—	10	pF
Input Impedance (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)		h_{ie}	5.0	—	kohms
Input Impedance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{ib}	20	30	Ohms

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

Characteristic	Symbol	Min	Max	Unit
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	h_{re}	—	6.0	X 10^{-4}
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)	h_{rb}	—	5.0	X 10^{-4}
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	h_{fe}	150	600	—
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	h_{oe}	5.0	30	μmhos
Output Admittance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)	h_{ob}	—	0.2	μmho
Noise Figure (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 kΩ, f = 1.0 kHz)	NF	—	7.0	dB
MATCHING CHARACTERISTICS				
DC Current Gain Ratio(2)	h_{FE1}/h_{FE2}			—
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc) 2N2453A		0.90	1.0	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)		0.90	1.0	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, T_A = −55°C to +125°C)		0.85	1.0	
Base-Emitter Voltage Differential	$\|V_{BE1}-V_{BE2}\|$			mVdc
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)		—	3.0	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)		—	5.0	
Base-Emitter Voltage Differential Gradient	$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$			μV/°C
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C to +125°C) 2N2453		—	10	
2N2453A		—	5.0	

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