

2N2453,A

CASE 654-07, STYLE 1

DUAL
AMPLIFIER TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	2N2453	2N2453A	Unit
Collector-Emitter Voltage	V_{CE0}	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 @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	200 1.14	300 1.71	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	600 3.43	1200 6.86	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

Refer to 2N2920 for graphs.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage(1) ($I_C = 10$ mAdc, $I_B = 0$)	$V_{CE0(sus)}$	30 50	— —	Vdc
Collector-Base Breakdown Voltage ($I_C = 10$ μ Adc, $I_E = 0$)	$V_{(BR)CBO}$	60 80	— —	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1$ μ Adc, $I_C = 0$)	$V_{(BR)EBO}$	7.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 50$ Vdc, $I_E = 0$) ($V_{CB} = 50$ Vdc, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	— —	0.005 10	μ Adc
Emitter Cutoff Current ($V_{BE} = 5.0$ Vdc, $I_C = 0$)	I_{EBO}	—	0.002	μ Adc

ON CHARACTERISTICS

DC Current Gain ($I_C = 10$ μ Adc, $V_{CE} = 5.0$ Vdc) ($I_C = 10$ μ Adc, $V_{CE} = 5.0$ Vdc, $T_A = -55^\circ\text{C}$) ($I_C = 1.0$ mAdc, $V_{CE} = 5.0$ Vdc) ($I_C = 1.0$ mAdc, $V_{CE} = 5.0$ Vdc, $T_A = -55^\circ\text{C}$)	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

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ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
Voltage Feedback Ratio ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{re}	—	6.0	$\times 10^{-4}$
Voltage Feedback Ratio ($I_C = 1.0\text{ mAdc}$, $V_{CB} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{rb}	—	5.0	$\times 10^{-4}$
Small-Signal Current Gain ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	150	600	—
Output Admittance ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{oe}	5.0	30	μmhos
Output Admittance ($I_C = 1.0\text{ mAdc}$, $V_{CB} = 5.0\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{ob}	—	0.2	μmho
Noise Figure ($I_C = 10\ \mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 10\text{ k}\Omega$, $f = 1.0\text{ kHz}$)	NF	—	7.0	dB

MATCHING CHARACTERISTICS

DC Current Gain Ratio(2) ($I_C = 100\ \mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$)	h_{FE1}/h_{FE2}	0.90 0.90 0.85	1.0 1.0 1.0	—
Base-Emitter Voltage Differential ($I_C = 10\ \mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	$ V_{BE1} - V_{BE2} $	— —	3.0 5.0	mVdc
Base-Emitter Voltage Differential Gradient ($I_C = 10\ \mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$)	$\frac{\Delta(V_{BE1} - V_{BE2})}{\Delta T_A}$	— —	10 5.0	$\mu\text{V}/^\circ\text{C}$

- (1) Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.
 (2) Lowest h_{FE} reading is taken as h_{FE1} for this ratio.

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