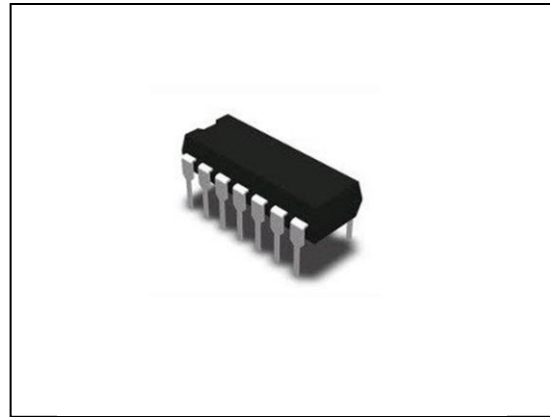


General Purpose Transistor Array One Differentially Connected Pair and Three Isolated Transistor Arrays

The CA3046E is designed for general purpose, low power applicants for consumer and industrial designs.

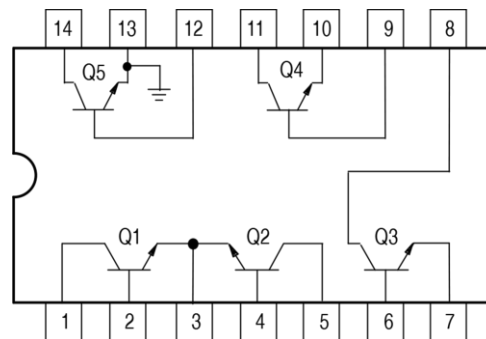
- Operating Current Range Specified: 10 μ A to 10 mA
- Five General Purpose Transistors in One Package



Device	Operating Temperature Range	Package
CA3046E	T _A = -40° to +85°C	Plastic DIP

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	15	Vdc
Collector-Base Voltage	V _{CB0}	20	Vdc
Emitter-Base Voltage	V _{EB}	5.0	Vdc
Collector-Substrate Voltage	V _{CIO}	20	Vdc
Collector Current - Continuous	I _C	50	mAdc
Total Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	1.2 10	W mW/°C
Operating Temperature Range	T _A	-40 to +85	°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

PIN CONNECTIONS



Pin 13 is connected to substrate and must remain at the lowest circuit potential.

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

Characteristics	Symbol	Min	Typ	Max	Unit
STATIC CHARACTERISTICS					
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}$)	$V_{(BR)CBO}$	20	60	-	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$)	$V_{(BR)CEO}$	15	-	-	Vdc
Collector-Substrate Breakdown Voltage ($I_C = 10 \mu\text{A}$)	$V_{(BR)CIO}$	20	60	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$)	$V_{(BR)EBO}$	5.0	7.0	-	Vdc
Collector-Base Cutoff Current ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	-	40	nAdc
DC Current Gain ($I_C = 10 \text{ mAdc}$, $V_{CE} = 3.0 \text{ Vdc}$) ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 3.0 \text{ Vdc}$) ($I_C = 10 \mu\text{Adc}$, $V_{CE} = 3.0 \text{ Vdc}$)	h_{FE}	- 40 -	140 130 60	- - -	-
Base-Emitter Voltage ($V_{CE} = 3.0 \text{ Vdc}$, $I_E = 1.0 \text{ mAdc}$) ($V_{CE} = 3.0 \text{ Vdc}$, $I_E = 10 \text{ mAdc}$)	V_{BE}	- -	0.72 0.8	- -	Vdc
Input Offset Current for Matched Pair Q1 and Q2 ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	$ I_{IO1} - I_{IO2} $	-	0.3	2.0	μAdc
Magnitude of Input Offset Voltage ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	-	-	0.5	5.0	mVdc
Temperature Coefficient of Base-Emitter Voltage ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	$\frac{\Delta V_{BE}}{D_T}$	-	-1.9	-	mV/ $^\circ\text{C}$
Temperature Coefficient	$\frac{ \Delta V_{IO} }{D_T}$	-	1.0	-	$\mu\text{V}/^\circ\text{C}$
Collector-Emitter Cutoff Current ($V_{CE} = 10 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	-	-	0.5	μAdc
DYNAMIC CHARACTERISTICS					
Low Frequency Noise Figure ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 100 \mu\text{Adc}$, $R_S = 1.0 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$)	NF	-	3.25	-	dB
Forward Current Transfer Ratio ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$, $f = 1.0 \text{ kHz}$)	h_{FE}	-	110	-	-
Short Circuit Input Impedance ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	h_{ie}	-	3.5	-	$\text{k}\Omega$
Open Circuit Output Impedance ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	h_{oe}	-	15.6	-	μmhos
Reverse Voltage Transfer Ratio ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$)	h_{re}	-	1.8	-	$\times 10^{-4}$
Forward Transfer Admittance ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$, $f = 1.0 \text{ MHz}$)	y_{fe}	-	31 - j1.5	-	-
Input Admittance ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$, $f = 1.0 \text{ MHz}$)	y_{ie}	-	0.3 + j0.04	-	-
Output Admittance ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 1.0 \text{ mAdc}$, $f = 1.0 \text{ MHz}$)	y_{oe}	-	0.001 + j0.03	-	-
Current-Gain – Bandwidth Product ($V_{CE} = 3.0 \text{ Vdc}$, $I_C = 3.0 \text{ mAdc}$)	f_T	300	550	-	MHz
Emitter-Base Capacitance ($V_{EB} = 3.0 \text{ Vdc}$, $I_E = 0$)	C_{eb}	-	0.6	-	pF
Collector-Base Capacitance ($V_{CB} = 3.0 \text{ Vdc}$, $I_C = 0$)	C_{cb}	-	0.58	-	pF
Collector-Substrate Capacitance ($V_{CS} = 3.0 \text{ Vdc}$, $I_C = 0$)	C_{Cl}	-	2.8	-	pF

Figure 1. Collector Cutoff Current Versus Temperature (Each Transistor)

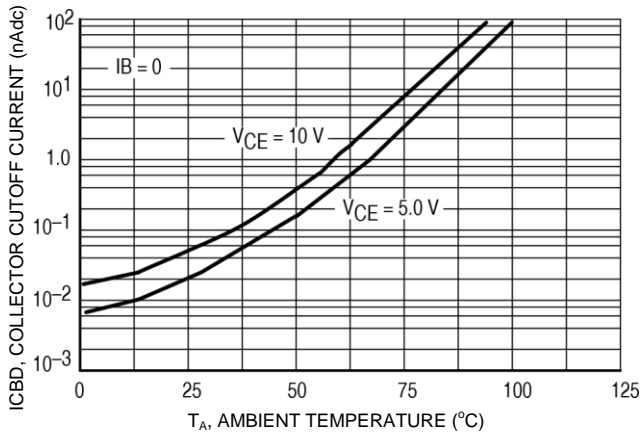


Figure 2. Collector Cutoff Current Versus Temperature (Each Transistor)

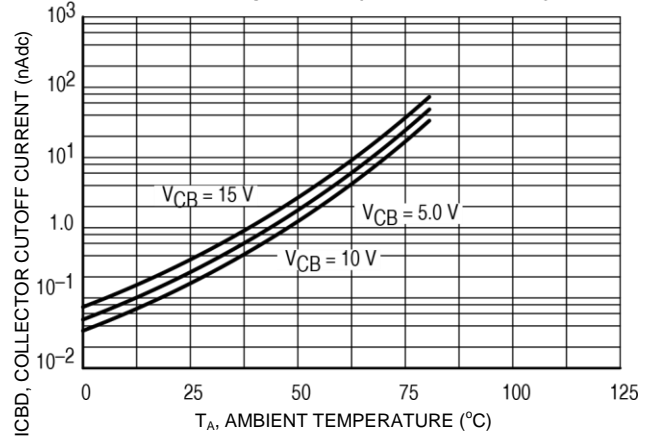


Figure 3. Input Offset Characteristics for Q1 and Q2

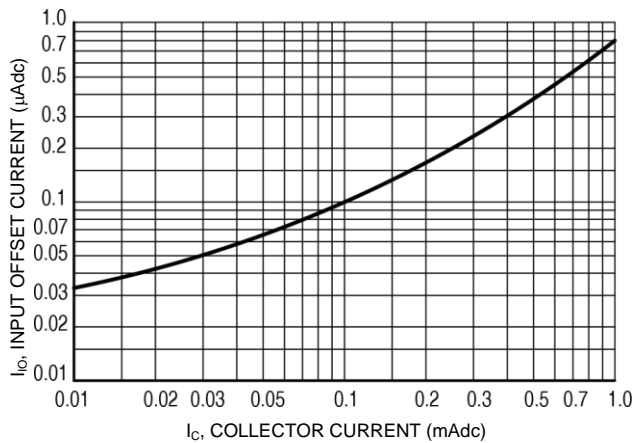


Figure 4. Base-Emitter and Input Offset Voltage Characteristics

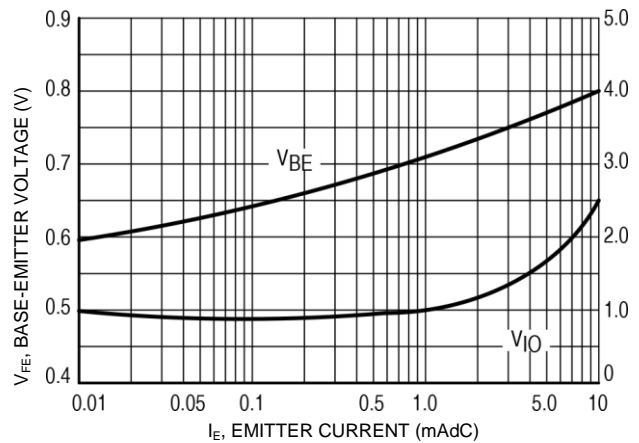


Figure 5. DC Current Gain

