



# General Purpose Transistor Array

## One Differentially Connected Pair and Three Isolated Transistor Arrays

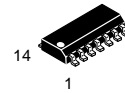
The CA3146 is designed for general purpose, low power applications in the dc through VHF range.

- Guaranteed Base–Emitter Voltage Matching
- Operating Current Range Specified: 10  $\mu$ A to 10 mA
- Five General Purpose Transistors in One Package

# CA3146

## GENERAL PURPOSE TRANSISTOR ARRAY

### SEMICONDUCTOR TECHNICAL DATA



**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751A  
(SO-14)

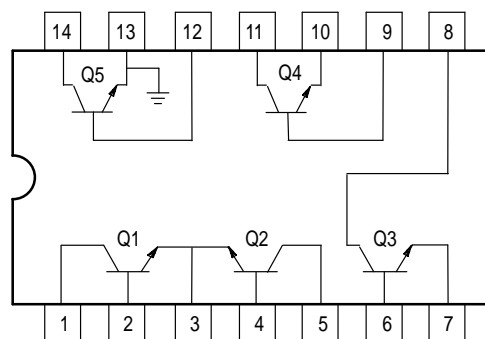
### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	130	Vdc
Collector–Base Voltage	$V_{CBO}$	20	Vdc
Collector–Substrate Voltage	$V_{CIO}$	20	Vdc
Emitter–Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current	$I_C$	50	mA <sub>dc</sub>
Operating Temperature Range	$T_A$	–40 to +85	°C
Storage Temperature Range	$T_{stg}$	–65 to +150	°C

### ORDERING INFORMATION

Device	Operating Temperature Range	Package
CA3146D	$T_A = -40^\circ \text{ to } +85^\circ \text{C}$	SO-14

### PIN CONNECTIONS



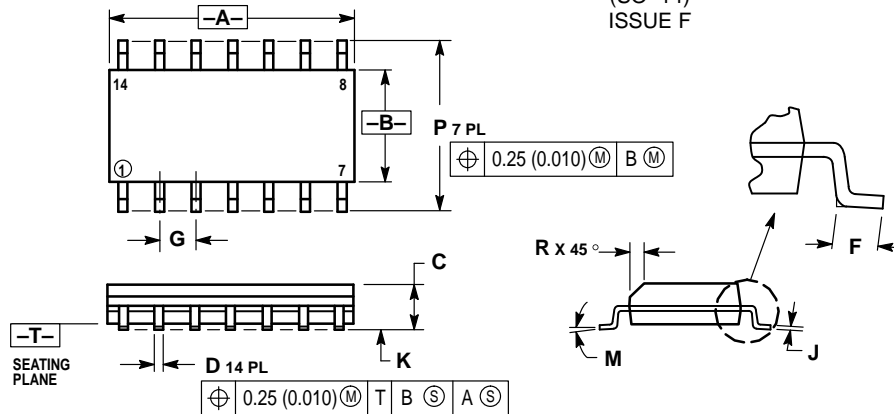
Pin 13 is connected to substrate and must remain at the lowest circuit potential.

## ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Typ	Max	Unit
<b>STATIC CHARACTERISTICS</b>					
Collector–Base Breakdown Voltage ( $I_C = 10 \mu\text{Adc}$ )	$V_{(BR)CBO}$	40	89	–	Vdc
Collector–Emitter Breakdown Voltage ( $I_C = 1.0 \text{ mAdc}$ )	$V_{(BR)CEO}$	35	45	–	Vdc
Collector–Substrate Breakdown Voltage ( $I_{CI} = 10 \mu\text{A}$ )	$V_{(BR)CIO}$	40	85	–	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10 \mu\text{A}$ )	$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector–Base Cutoff Current ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	0.68	40	nAdc
DC Current Gain ( $I_C = 10 \text{ mAdc}$ , $V_{CE} = 5.0 \text{ Vdc}$ ) ( $I_C = 1.0 \text{ mAdc}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	– –	171 188	– –	–
Base–Emitter Voltage ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_E = 1.0 \text{ mAdc}$ )	$V_{BE}$	–	0.7	–	Vdc
Collector–Emitter Saturation Voltage ( $I_C = 10 \text{ mA}$ , $I_B = 0.4 \text{ mA}$ )	$V_{CE(sat)}$	–	0.28	0.5	Vdc
Magnitude of Input Offset Current $ I_{IO1} - I_{IO2} $ ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_{C1} = I_{C2} = 1.0 \text{ mAdc}$ )	$I_{IO}$	–	0.03	2.0	$\mu\text{Adc}$
Magnitude of Input Offset Voltage $ V_{BE1} - V_{BE2} $ ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_E = 1.0 \text{ mAdc}$ )	$ V_{IO} $	–	0.13	2.0	mVdc
<b>DYNAMIC CHARACTERISTICS</b>					
Low Frequency Noise Figure ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 100 \mu\text{Adc}$ , $R_S = 1.0 \text{ k}\Omega$ , $f = 1.0 \text{ kHz}$ )	NF	–	3.25	–	dB
Forward Current Transfer Ratio ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{fe}$	–	201.5	–	–
Short Circuit Input Impedance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{ie}$	–	6.7	–	$\text{k}\Omega$
Open Circuit Output Impedance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{oe}$	–	15.6	–	$\mu\text{mho}$
Reverse Voltage Transfer Ratio ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{re}$	–	3.5	–	$\times 10^{-4}$
Input Admittance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$Y_{ie}$	–	$0.14 + j0.16$	–	mmho
Forward Transfer Admittance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$Y_{fe}$	–	$34.6 - j0.63$	–	mmho
Reverse Transfer Admittance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$Y_{re}$	–	$62.0 - j59.4$	–	$\mu\text{mho}$
Output Admittance ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 1.0 \text{ mAdc}$ , $f = 1.0 \text{ kHz}$ )	$Y_{oe}$	–	$0.16 + j0.14$	–	mmho
Current–Gain – Bandwidth Product ( $V_{CE} = 5.0 \text{ Vdc}$ , $I_C = 3.0 \text{ mAdc}$ )	$f_T$	300	500	–	MHz
Emitter–Base Capacitance ( $V_{EB} = 5.0 \text{ Vdc}$ , $I_E = 0 \text{ mAdc}$ )	$C_{EB}$	–	1.17	–	pF
Collector–Base Capacitance ( $V_{CB} = 5.0 \text{ Vdc}$ , $I_E = 0 \text{ mAdc}$ )	$C_{CB}$	–	0.68	–	pF
Collector–Substrate Capacitance ( $V_{CS} = 5.0 \text{ Vdc}$ , $I_C = 0 \text{ mAdc}$ )	$C_{CI}$	–	1.92	–	pF

## OUTLINE DIMENSIONS


**D SUFFIX**  
**PLASTIC PACKAGE**  
CASE 751A-03  
(SO-14)  
ISSUE F



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.228	0.244
R	0.25	0.50	0.010	0.019

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