



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

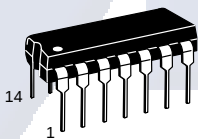
The MC3346 is designed for general purpose, low power applications for consumer and industrial designs.

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

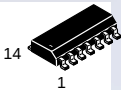
MC3346

GENERAL PURPOSE TRANSISTOR ARRAY

SEMICONDUCTOR TECHNICAL DATA



P SUFFIX
PLASTIC PACKAGE
CASE 646



D SUFFIX
PLASTIC PACKAGE
CASE 751A
(SO–14)

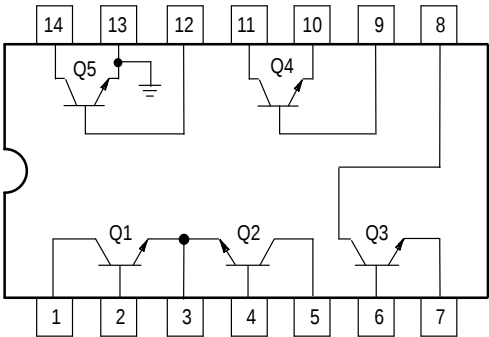
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	15	Vdc
Collector–Base Voltage	V_{CBO}	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 @ $T_A = 25^{\circ}\text{C}$ Derate above 25°C	P_D	1.2 10	W mW/ $^{\circ}\text{C}$
Operating Temperature Range	T_A	-40 to $+85$	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-65 to $+150$	$^{\circ}\text{C}$

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC3346D	$T_A = -40^{\circ}$ to $+85^{\circ}\text{C}$	SO–14
MC3356P		Plastic DIP

PIN CONNECTIONS



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

MC3346

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

Characteristics	Symbol	Min	Typ	Max	Unit
STATIC CHARACTERISTICS					
Collector–Base Breakdown Voltage (I _C = 10 µAdc)	V _{(BR)CBO}	20	60	–	Vdc
Collector–Emitter Breakdown Voltage (I _C = 1.0 mAdc)	V _{(BR)CEO}	15	–	–	Vdc
Collector–Substrate Breakdown Voltage (I _C = 10 µA)	V _{(BR)CIO}	20	60	–	Vdc
Emitter–Base Breakdown Voltage (I _E = 10 µAdc)	V _{(BR)EBO}	5.0	7.0	–	Vdc
Collector–Base Cutoff Current (V _{CB} = 10 Vdc, I _E = 0)	I _{CBO}	–	–	40	nAdc
DC Current Gain (I _C = 10 mAdc, V _{CE} = 3.0 Vdc) (I _C = 1.0 mAdc, V _{CE} = 3.0 Vdc) (I _C = 10 µAdc, V _{CE} = 3.0 Vdc)	h _{FE}	– 40 –	140 130 60	– – –	–
Base–Emitter Voltage (V _{CE} = 3.0 Vdc, I _E = 1.0 mAdc) (V _{CE} = 3.0 Vdc, I _E = 10 mAdc)	V _{BE}	– –	0.72 0.8	– –	Vdc
Input Offset Current for Matched Pair Q1 and Q2 (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	I _{O1} – I _{O2}	–	0.3	2.0	µAdc
Magnitude of Input Offset Voltage (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	–	–	0.5	5.0	mVdc
Temperature Coefficient of Base–Emitter Voltage (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	$\frac{\Delta V_{BE}}{D_T}$	–	–1.9	–	mV/°C
Temperature Coefficient	$\frac{ \Delta V_{IO} }{D_T}$	–	1.0	–	µV/°C
Collector–Emitter Cutoff Current (V _{CE} = 10 Vdc, I _B = 0)	I _{CEO}	–	–	0.5	µAdc
DYNAMIC CHARACTERISTICS					
Low Frequency Noise Figure (V _{CE} = 3.0 Vdc, I _C = 100 µAdc, R _S = 1.0 kΩ, f = 1.0 kHz)	NF	–	3.25	–	dB
Forward Current Transfer Ratio (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc, f = 1.0 kHz)	h _{FE}	–	110	–	–
Short Circuit Input Impedance (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	h _{ie}	–	3.5	–	kΩ
Open Circuit Output Impedance (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	h _{oe}	–	15.6	–	µmhos
Reverse Voltage Transfer Ratio (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc)	h _{re}	–	1.8	–	x10 ^{–4}
Forward Transfer Admittance (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc, f = 1.0 MHz)	y _{fe}	–	31–j1.5	–	–
Input Admittance (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc, f = 1.0 MHz)	y _{ie}	–	0.3 + j0.04	–	–
Output Admittance (V _{CE} = 3.0 Vdc, I _C = 1.0 mAdc, f = 1.0 MHz)	y _{oe}	–	0.001 + j0.03	–	–
Current–Gain – Bandwidth Product (V _{CE} = 3.0 Vdc, I _C = 3.0 mAdc)	f _T	300	550	–	MHz
Emitter–Base Capacitance (V _{EB} = 3.0 Vdc, I _E = 0)	C _{eb}	–	0.6	–	pF
Collector–Base Capacitance (V _{CB} = 3.0 Vdc, I _C = 0)	C _{cb}	–	0.58	–	pF
Collector–Substrate Capacitance (V _{CS} = 3.0 Vdc, I _C = 0)	C _{CI}	–	2.8	–	pF

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

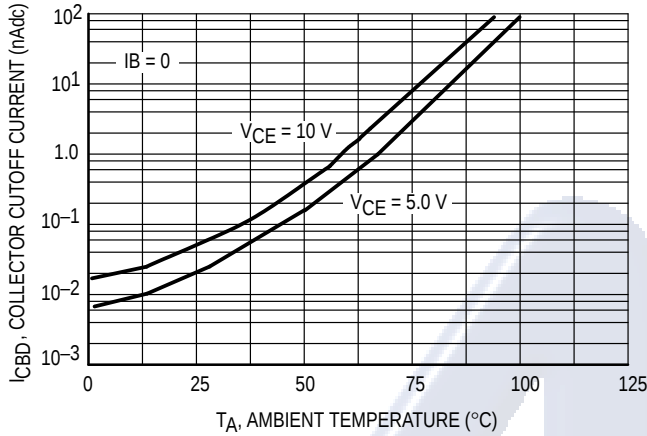


Figure 2. Collector Cutoff Current versus Temperature (Each Transistor)

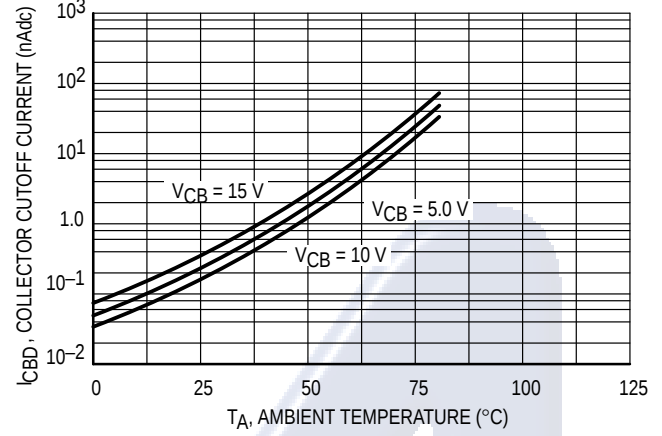


Figure 3. Input Offset Characteristics for Q1 and Q2

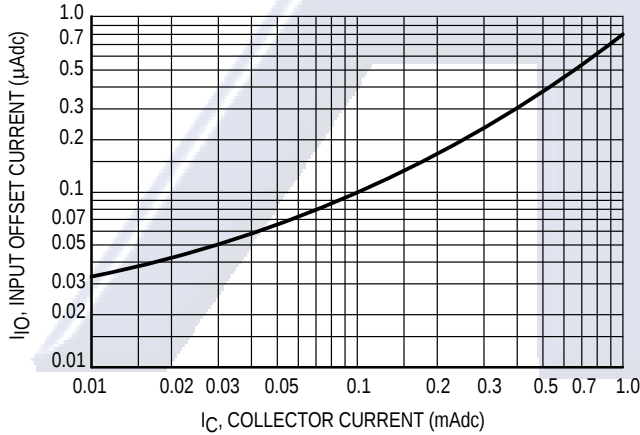


Figure 4. Base-Emitter and Input Offset Voltage Characteristics

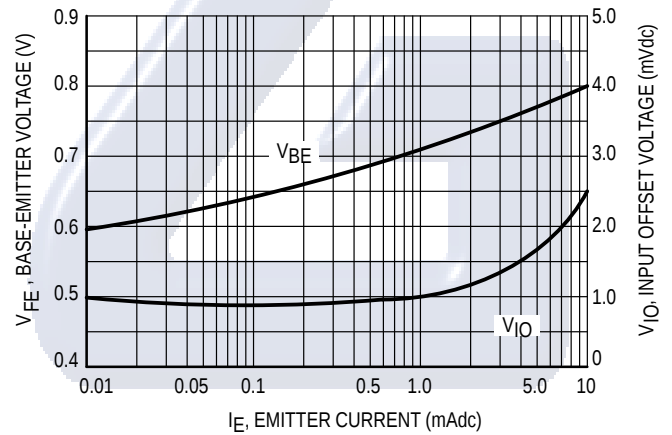
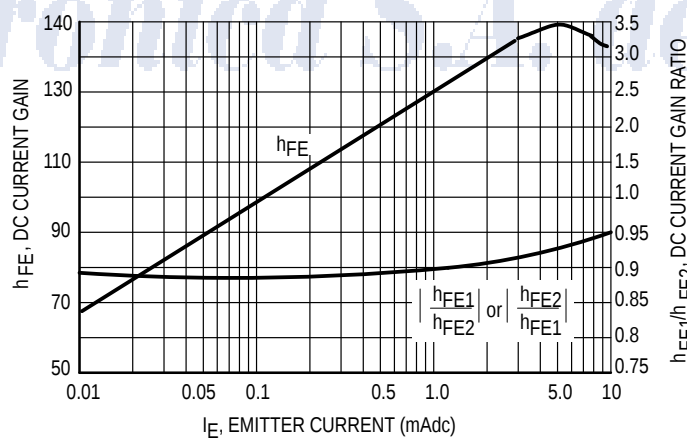
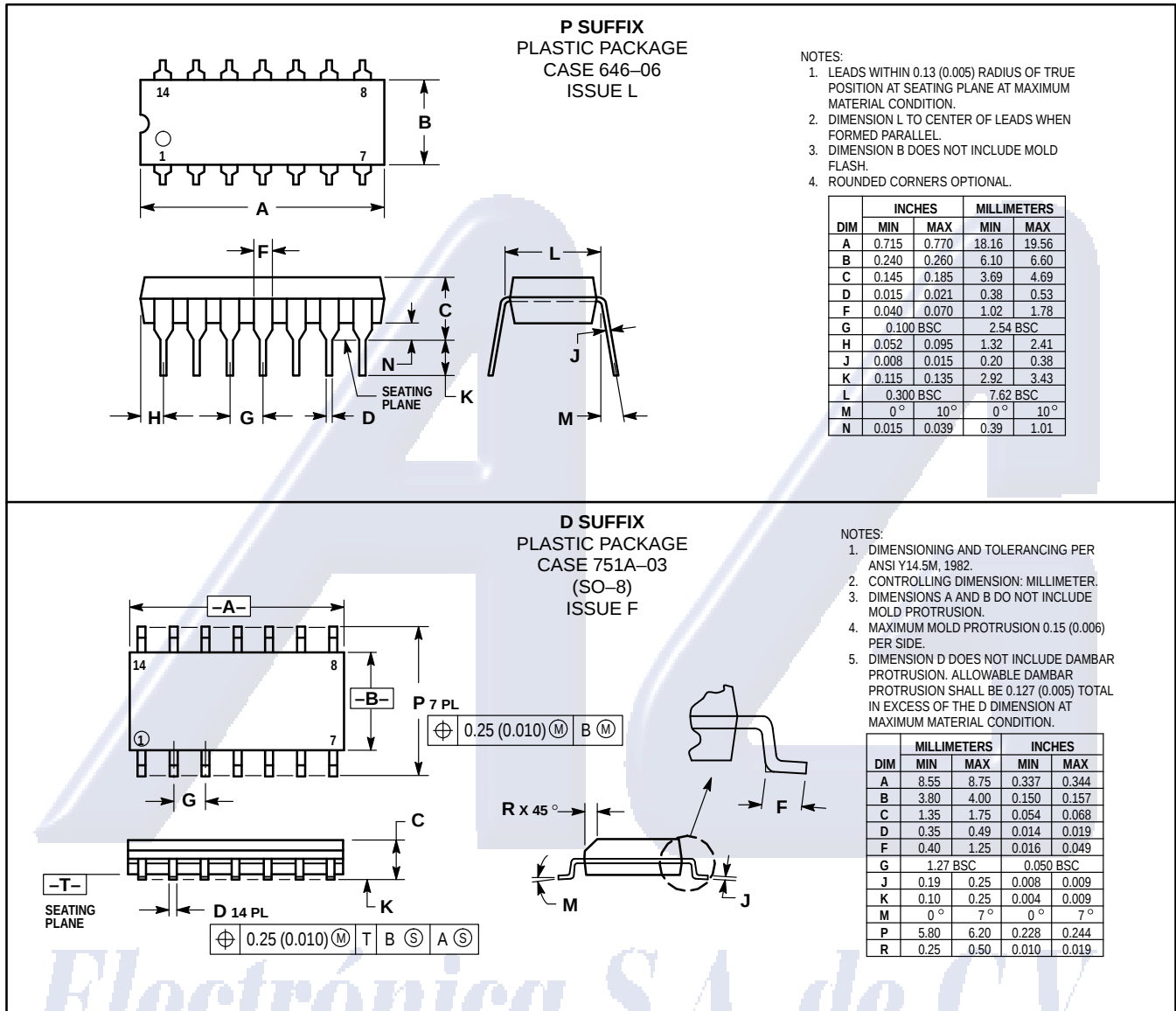


Figure 5. DC Current Gain



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OUTLINE DIMENSIONS



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