

# MDC03

Transistor, array, 3 × NPN,  
3 × PNP

## Features

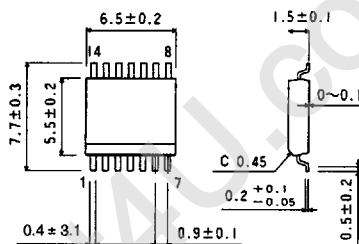
- available in MFW14 package
- package marking: MDC03
- three NPN transistors with common emitter and three PNP transistors with common emitter are mounted in single package
- each device has a base resistor (10 kΩ)
- protection diode connected between each collector and emitter
- each transistor has very low collector-to-emitter saturation voltage ( $V_{CE(sat)}$ )

## Applications

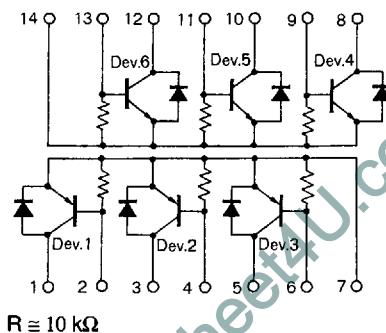
- motor driver

## Dimensions (Units : mm)

MDC03 (MFW14)



## Equivalent circuit



Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

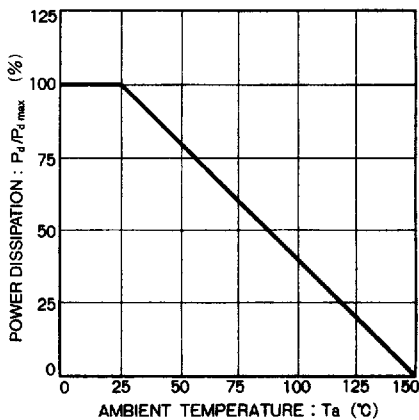
Parameter	Symbol	Limits		Unit	Conditions
		PNP device	NPN device		
Collector-to-base voltage	$V_{CBO}$	-10	10	V	
Collector-to-emitter voltage	$V_{CEO}$	-10	10	V	
Emitter-to-base voltage	$V_{EBO}$	-6	6	V	
Collector current	$I_C$	-3	3	A	Single pulse, $P_W = 10$ ms
	$I_{CP}$	-4	4		
Collector dissipation	$P_C$	500		mW	
Junction temperature	$T_j$	150		$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 ~ +150		$^\circ\text{C}$	

PNP transistor electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	$BV_{CBO}$	-10			V	$I_C = -50 \mu\text{A}$
Collector-to-emitter breakdown voltage	$BV_{CEO}$	-10			V	$I_C = -1$ mA
Collector cutoff current	$I_{CBO}$			-1.0	$\mu\text{A}$	$V_{CB} = -10$ V
DC current gain	$h_{FE}$	200				$V_{CE} = -1$ V, $I_C = -0.5$ A
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		-0.3	-0.4	V	$I_C/I_B = -2.0$ A/-50 mA
Forward voltage	$V_F$		-1.0	-1.5	V	$I_F = -1.0$ A
Emitter-to-base resistance	R	7	10	13	k $\Omega$	
Transition frequency	$f_T$		150		MHz	$V_{CE} = -6$ V, $I_E = 50$ mA, $f = 100$ MHz
Output capacitance	$C_{ob}$		70		pF	$V_{CB} = -10$ V, $I_E = 0$ mA, $f = 1$ MHz

**NPN transistor electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ )**

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	$BV_{CBO}$	10			V	$I_C = 50 \mu\text{A}$
Collector-to-emitter breakdown voltage	$BV_{CEO}$	10			V	$I_C = 1 \text{ mA}$
Collector cutoff current	$I_{CBO}$			1.0	$\mu\text{A}$	$V_{CB} = 10 \text{ V}$
DC current gain	$h_{FE}$	200				$V_{CE} = 1 \text{ V}, I_C = 0.5 \text{ A}$
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		0.2	0.3	V	$I_C/I_B = 2.0 \text{ A}/50 \text{ mA}$
Forward voltage	$V_F$		1.0	1.5	V	$I_F = 1.0 \text{ A}$
Emitter-to-base resistance	R	7	10	13	$\text{k}\Omega$	
Transition frequency	$f_T$		150		MHz	$V_{CE} = 6 \text{ V}, I_E = -50 \text{ mA}, f = 100 \text{ MHz}$
Output capacitance	$C_{ob}$		70		pF	$V_{CB} = 10 \text{ V}, I_E = 0 \text{ mA}, f = 1 \text{ MHz}$

**Electrical characteristic curves****Figure 1**

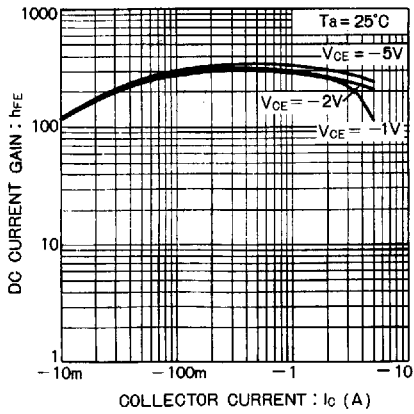


Figure 2 (PNP)

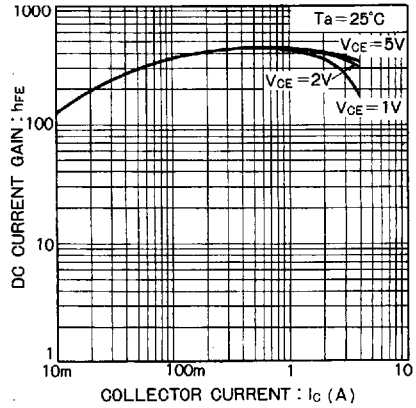


Figure 3 (NPN)

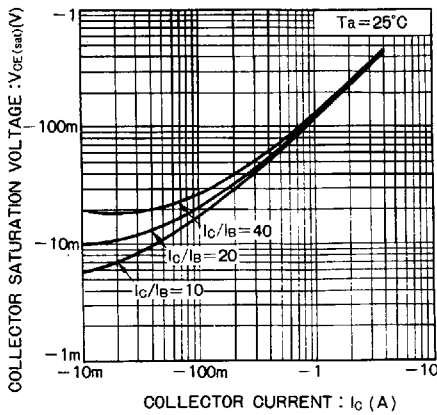


Figure 4 (PNP)

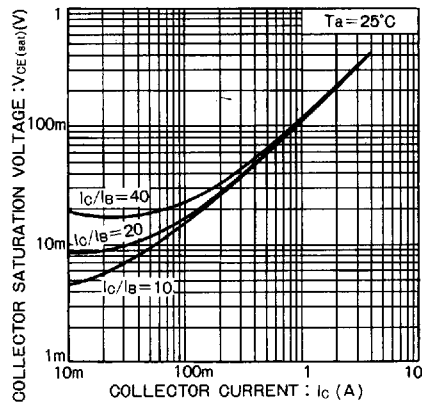


Figure 5 (NPN)

Ordering information

Package	Tape
Code	TR
Basic order quantity	2500
MDC03	☆
★ = Standard, ☆ = Semi-standard, * = Special order	