

# M54577P

7-UNIT 30mA TRANSISTOR ARRAY

## DESCRIPTION

M54577P is seven-circuit transistor arrays. The circuits are made of NPN transistors. The semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

## FEATURES

- Medium breakdown voltage ( $BV_{CEO} \geq 30V$ )
- Output sink current ( $I_{C(max)} = 30mA$ )
- Driving available with MOS (PMOS, CMOS) IC output
- Low output saturation voltage ( $V_{CE(sat)} = 0.35V$  at  $I_C = 20mA$ )
- Wide operating temperature range ( $T_a = -20$  to  $+75^\circ C$ )

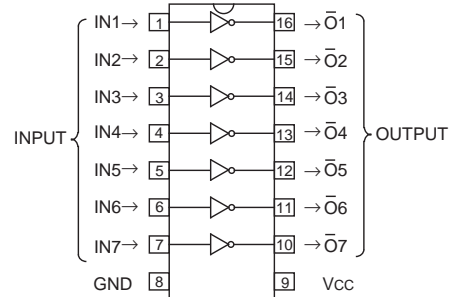
## APPLICATION

Driving of digit drives of indication elements (LEDs and lamps)

## FUNCTION

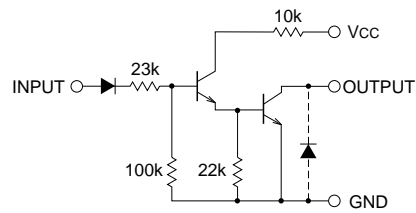
The M54577P has seven circuits consisting of NPN transistor. This Ic uses a predriver stage with a diode and 23kΩ resistor in series to input. The output transistor emitters are all connected to the GND pin (pin 8), and Vcc is connected to pin 9. The collector current are capable of sinking 30mA maximum. Collector-emitter supply voltage is 30V maximum. Collector-emitter saturation voltage is below 0.35V ( $I_C = 20mA$ ) Drives active "H" input.

## PIN CONFIGURATION



Package type 16P4(P)

## CIRCUIT DIAGRAM



The seven circuits share the Vcc and GND.

The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit : Ω

## ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -20 \sim +75^\circ C$ )

Symbol	Parameter	Conditions	Ratings	Unit
Vcc	Supply voltage		13	V
VCEO	Collector-emitter voltage	Output, H	-0.5 ~ +30	V
IC	Collector current	Current per circuit output, L	30	mA
Vi	Input voltage		-20 ~ Vcc	V
Pd	Power dissipation	$T_a = 25^\circ C$ , when mounted on board	1.47	W
Topr	Operating temperature		-20 ~ +75	$^\circ C$
Tstg	Storage temperature		-55 ~ +125	$^\circ C$

**RECOMMENDED OPERATING CONDITIONS** (Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter	Limits			Unit
		min	typ	max	
V <sub>CC</sub>	Supply voltage	4.5	5	13	V
I <sub>C</sub>	Collector current (Current per 1 circuit)	0	10	20	mA
V <sub>IH</sub>	"H" input voltage	3	—	V <sub>CC</sub>	V
V <sub>IL</sub>	"L" input voltage	0	—	1	V

**ELECTRICAL CHARACTERISTICS** (Unless otherwise noted, Ta = 25°C)

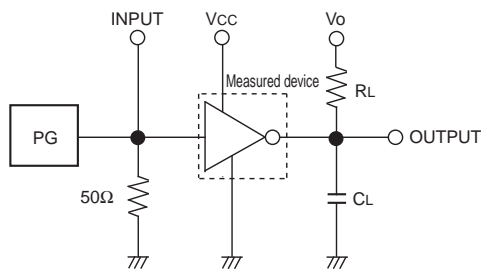
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
V (BR) CEO	Collector-emitter breakdown voltage	I <sub>CEO</sub> = 100μA	30	—	—	V
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	V <sub>CC</sub> = 4.5V, V <sub>I</sub> = 3V, I <sub>C</sub> = 10mA	—	—	0.25	V
		V <sub>CC</sub> = 6V, V <sub>I</sub> = 3V, I <sub>C</sub> = 20mA	—	—	0.35	
I <sub>I</sub>	Input current	V <sub>CC</sub> = 4.5V, V <sub>I</sub> = 3V	30	—	90	μA
I <sub>CC</sub>	Supply current (Only one time operation)	V <sub>CC</sub> = 4.5V, V <sub>I</sub> = 3V	—	0.4	0.9	mA
		V <sub>CC</sub> = 13V, V <sub>I</sub> = 3V	—	1.3	2.3	
hFE	DC amplification factor	V <sub>CE</sub> = 4V, V <sub>CC</sub> = 4.5V, I <sub>C</sub> = 20mA, Ta = 25°C	500	1200	—	—

\* : The typical values are those measured under ambient temperature (Ta) of 25°C. There is no guarantee that these values are obtained under any conditions.

**SWITCHING CHARACTERISTICS** (Unless otherwise noted, Ta = 25°C)

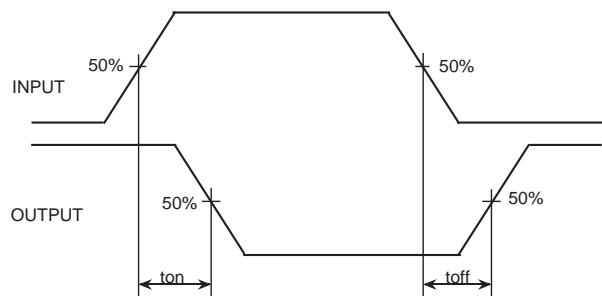
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t <sub>on</sub>	Turn-on time	C <sub>L</sub> = 15pF (note 1)	—	210	—	ns
t <sub>off</sub>	Turn-off time		—	3200	—	ns

**NOTE 1 TEST CIRCUIT**



- (1) Pulse generator (PG) characteristics : PRR=1kHz,  
tw = 10μs, tr = 6ns, tf = 6ns, Zo = 50Ω, VP = 3VP-P
- (2) Input-output conditions : RL = 500Ω, Vo = 10V, VCC = 6V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

**TIMING DIAGRAM**



TYPICAL CHARACTERISTICS

