

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

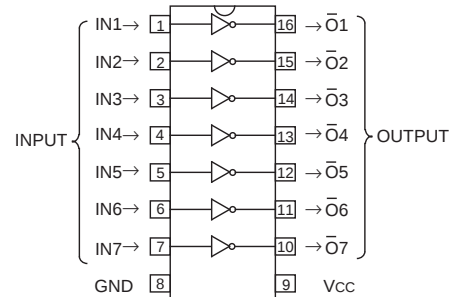
- Medium breakdown voltage ($BV_{CEO} \geq 30V$)
- Output sink current ($I_{C(max)} = 30mA$)
- Driving available with MOS (PMOS, CMOS) IC output
- Low output saturation voltage ($V_{CE(sat)} = 0.35V$ at $I_C = 20mA$)
- Wide operating temperature range ($T_a = -20$ to $+75^\circ C$)

APPLICATION

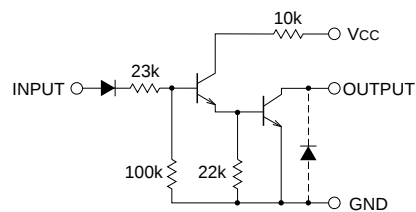
Driving of digit drives of indication elements (LEDs and lamps)

FUNCTION

The M54577P has seven circuits consisting of NPN transistor. This IC uses a predriver stage with a diode and $23k\Omega$ resistor in series to input. The output transistor emitters are all connected to the GND pin (pin 8), and V_{CC} 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 DIAGRAMThe seven circuits share the V_{CC} 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
V_{CC}	Supply voltage		13	V
V_{CEO}	Collector-emitter voltage	Output, H	$-0.5 \sim +30$	V
I_C	Collector current	Current per circuit output, L	30	mA
V_I	Input voltage		$-20 \sim V_{CC}$	V
P_d	Power dissipation	$T_a = 25^\circ C$, when mounted on board	1.47	W
T_{opr}	Operating temperature		$-20 \sim +75$	$^\circ C$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ C$

RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, $T_a = -20 \sim +75^\circ\text{C}$)

Symbol	Parameter	Limits			Unit
		min	typ	max	
V_{CC}	Supply voltage	4.5	5	13	V
I_C	Collector current (Current per 1 circuit)	0	10	20	mA
V_{IH}	"H" input voltage	3	—	V_{CC}	V
V_{IL}	"L" input voltage	0	—	1	V

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $T_a = 25^\circ\text{C}$)

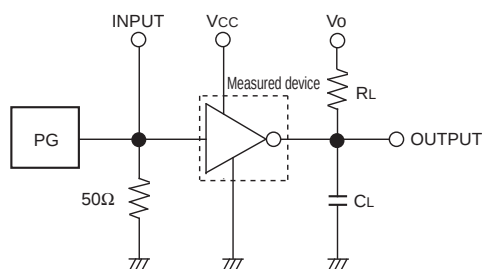
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_{CEO} = 100\mu\text{A}$	30	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_{CC} = 4.5\text{V}$, $V_i = 3\text{V}$, $I_C = 10\text{mA}$	—	—	0.25	V
		$V_{CC} = 6\text{V}$, $V_i = 3\text{V}$, $I_C = 20\text{mA}$	—	—	0.35	
I_i	Input current	$V_{CC} = 4.5\text{V}$, $V_i = 3\text{V}$	30	—	90	μA
I_{CC}	Supply current (Only one time operation)	$V_{CC} = 4.5\text{V}$, $V_i = 3\text{V}$	—	0.4	0.9	mA
		$V_{CC} = 13\text{V}$, $V_i = 3\text{V}$	—	1.3	2.3	
h_{FE}	DC amplification factor	$V_{CE} = 4\text{V}$, $V_{CC} = 4.5\text{V}$, $I_C = 20\text{mA}$, $T_a = 25^\circ\text{C}$	500	1200	—	—

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

SWITCHING CHARACTERISTICS (Unless otherwise noted, $T_a = 25^\circ\text{C}$)

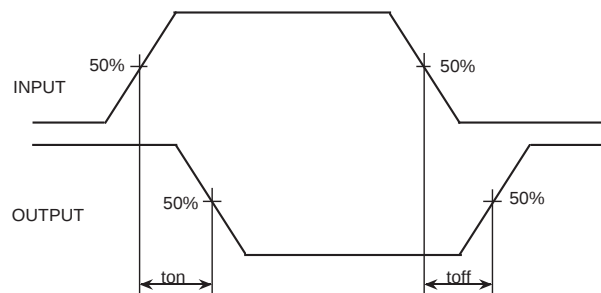
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	$C_L = 15\text{pF}$ (note 1)	—	210	—	ns
t_{off}	Turn-off time		—	3200	—	ns

NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics : PRR=1kHz,
 $t_w = 10\mu\text{s}$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$, $Z_o = 50\Omega$, $V_P = 3\text{VP-P}$
 (2) Input-output conditions : $R_L = 500\Omega$, $V_o = 10\text{V}$, $V_{CC} = 6\text{V}$
 (3) Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM



TYPICAL CHARACTERISTICS

