

M54513P/FP

8-UNIT 50mA TRANSISTOR ARRAY

DESCRIPTION

M54513P and M54513FP are eight-circuit transistor arrays. The circuits are made of NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

FEATURES

- High breakdown voltage ($BV_{CEO} \geq 40V$)
- Synchronizing current ($I_c(max) = 50mA$)
- Wide operating temperature range ($T_a = -20$ to $+75^\circ C$)

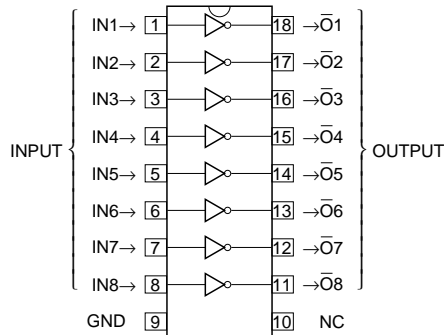
APPLICATION

Driving of digit drives of indication elements (LEDs and lamps) with small signals

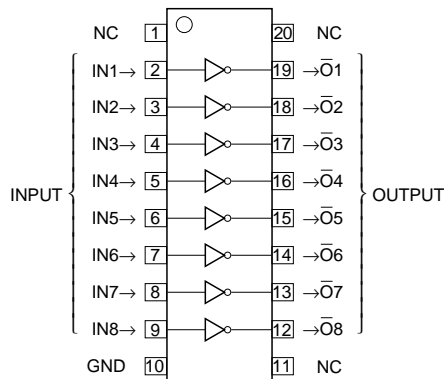
FUNCTION

The M54513P and M54513FP each have eight circuits consisting of NPN transistors. These ICs have resistance of 2 kΩ at inputs and of 13.6kΩ between the base and emitter. The GND is used in common in each circuit. The transistors allow synchronous flow of 50mA collector current. A maximum of 40V voltage can be applied between the collector and emitter. The M54513FP is enclosed in a molded small flat package, enabling space-saving design.

PIN CONFIGURATION

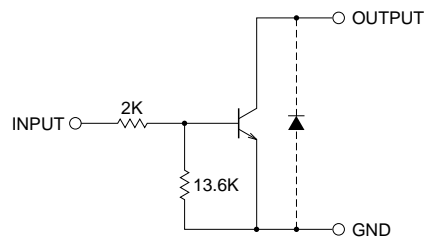


Package type 18P4G(P) NC : No connection



Package type 20P2N-A(FP) NC : No connection

CIRCUIT DIAGRAM



The eight circuits share the GND.

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

Unit : Ω

M54513P/FP

8-UNIT 50mA TRANSISTOR ARRAY

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, Ta = -20 ~ +75°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|------------------|---------------------------|----------------------------------|------------------|------|
| V _{CEO} | Collector-emitter voltage | Output, H | -0.5 ~ +40 | V |
| I _C | Collector current | Current per circuit output, L | 50 | mA |
| V _I | Input voltage | | -0.5 ~ +10 | V |
| P _d | Power dissipation | Ta = 25°C, when mounted on board | 1.79(P)/1.10(FP) | W |
| T _{opr} | Operating temperature | | -20 ~ +75 | °C |
| T _{stg} | Storage temperature | | -55 ~ +125 | °C |

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

| Symbol | Parameter | Limits | | | Unit |
|-----------------|-------------------|--------|-----|-----|------|
| | | min | typ | max | |
| V _o | Output voltage | 0 | — | 40 | V |
| I _C | Collector current | 0 | — | 30 | mA |
| V _{IH} | "H" input voltage | 2 | — | 8 | V |
| V _{IL} | "L" input voltage | 0 | — | 0.2 | V |

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = -20 ~ +75°C)

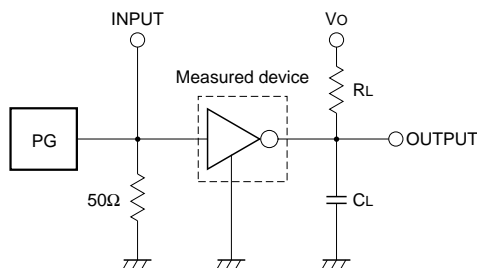
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------------------|--------------------------------------|--|--------|----------|------------|------|
| | | | min | typ* | max | |
| V (BR) CEO | Collector-emitter breakdown voltage | I _{CEO} = 100μA | 40 | — | — | V |
| V _{CE (sat)} | Collector-emitter saturation voltage | V _I = 2V, I _C = 10mA V _I = 2.5V, I _C = 30mA | — | 25 70 | 100 170 | mV |
| I _I | Input current | V _I = 2.5V | — | 0.85 | 1.7 | mA |
| h _{FE} | DC amplification factor | V _{CE} = 4V, I _C = 30mA, Ta = 25°C | 80 | 200 | — | — |

* : 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)

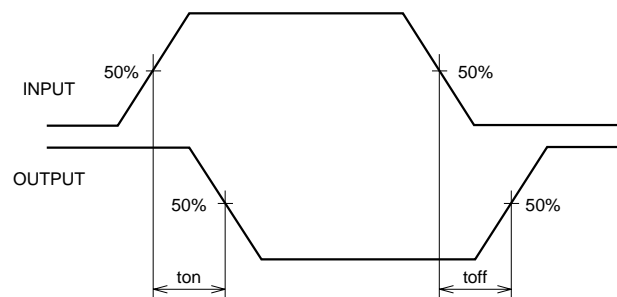
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|------------------|---------------|--------------------------------|--------|------|-----|------|
| | | | min | typ | max | |
| t _{on} | Turn-on time | C _L = 15pF (note 1) | — | 65 | — | ns |
| t _{off} | Turn-off time | | — | 1200 | — | ns |

NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics : PRR = 1kHz, tw = 10μs, tr = 6ns, tf = 6ns, ZO = 50Ω, VP = 2.5VP-P
- (2) Output conditions : RL = 300Ω, Vo = 10V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM



TYPICAL CHARACTERISTICS

