

DESCRIPTION

The M54460 is a semiconductor integrated circuit consisting of a built-in 1/10 and 1/100 high speed frequency divider featuring an ECL circuit configuration.

FEATURES

- High-speed operation ($f_{max} = 130\text{MHz}$)
- Operation at low input amplitudes (200mV_{P-P} minimum input amplitude)
- Open collector type of output

APPLICATION

FM radio prescalers

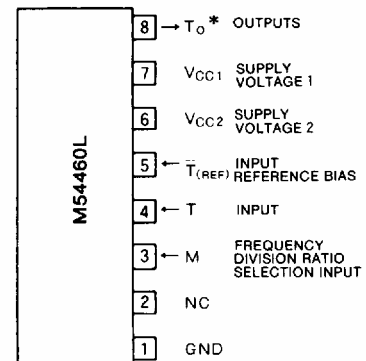
Digital equipment for consumer and industrial applications.

FUNCTION

This driver is based on an ECL circuit configuration. When a frequency up to a maximum of 130MHz is applied to the T input pin, a 1/10-divided output is produced when the division ratio selection input pin (M) is low-level or a 1/100-divided output is produced when the division ratio selection input pin (M) is high-level. The output (T_0) is an open collector output.

When you use the V_{CC1} (7pin), the V_{CC2} (6pin) must be opened. And you use the V_{CC2} (6pin), the V_{CC1} (7pin) must be opened.

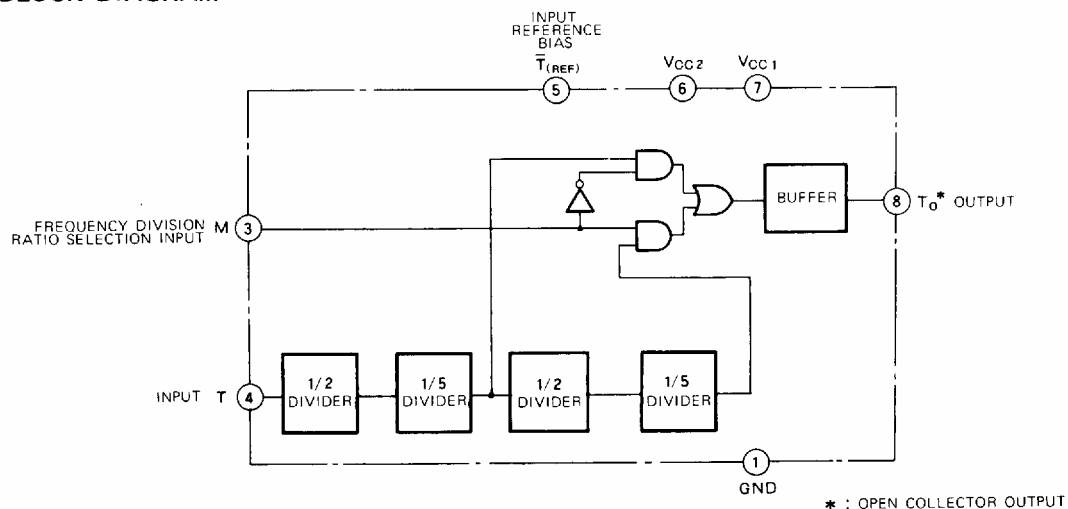
PIN CONFIGURATION (TOP VIEW)



* : Open connector output
NC : No connection

Outline 8P5

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|------------------------|--------------------------|-----------------|------------------|
| V_{CC1} | Supply voltage 1 | | 5 | V |
| V_{CC2} | Supply voltage 2 | | 7 | V |
| V_i | Input voltage | | 2.5 | V |
| V_o | Output applied voltage | | 5.5 | V |
| P_d | Power dissipation | $T_a = 75^\circ\text{C}$ | 650 | mW |
| T_{opr} | Operating temperature | | $-10 \sim +75$ | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | $-55 \sim +125$ | $^\circ\text{C}$ |

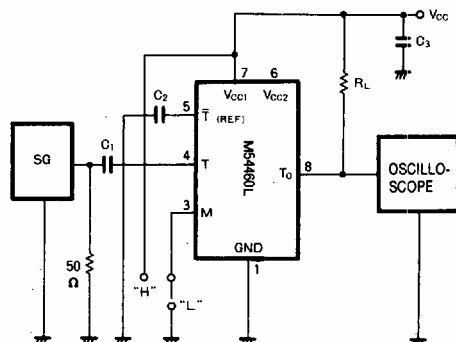
RECOMMENDED OPERATING CONDITIONS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Limits | | | Unit |
|-------------|----------------------------|---|--------|-----|-----|-------------------|
| | | | Min | Typ | Max | |
| V_{CC1} | Supply voltage 1 | | 2.7 | 3 | 3.3 | V |
| V_{CC2} | Supply voltage 2 | | 4.5 | 5 | 5.5 | V |
| f_{IN} | Input frequency | | 30 | | 130 | MHz |
| V_{IN} | Input amplitude | $V_{CC1} = 3\text{V}, f_{IN} = 30 \sim 130\text{MHz}$ | 200 | | 800 | mV _{P-P} |
| $V_{IH(M)}$ | High-level M input voltage | $V_{CC1} = 3\text{V}, V_{CC2} : \text{Open}$ | 2.6 | | 3 | V |
| $V_{IL(M)}$ | Low-level M input voltage | $V_{CC1} : \text{Open}, V_{CC2} = 5\text{V}$ | | | 0.4 | V |

ELECTRICAL CHARACTERISTICS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---------------|----------------------------|---|--------|-----|-----|-------------------|
| | | | Min | Typ | Max | |
| I_{CC1} | Supply current 1 | $V_{CC1} = 3\text{V}$ | | 6 | 9 | mA |
| I_{CC2} | Supply current 2 | $V_{CC2} = 5\text{V}$ | | 8 | | mA |
| V_{IN} | Input frequency | $V_{CC1} = 3\text{V}, f_{IN} = 30 \sim 130\text{MHz}, T_a = 25^\circ\text{C}$ | | | 150 | mV _{P-P} |
| $I_{IH(M)}$ | High-level M input current | $V_{CC} = 3\text{V}, V_{IH(M)} = 2.6\text{V}$ | | 2 | | μA |
| $I_{IL(M)}$ | Low-level M input current | $V_{CC} = 3\text{V}, V_{IL(M)} = 0.4\text{V}$ | | 0.1 | | μA |
| $I_{O(leak)}$ | Output leak current | $V_{CC} = 3\text{V}, V_o = 5.5\text{V}$ | | | 100 | μA |
| V_{OL} | Low-level output voltage | $V_{CC} = 3\text{V}, I_{OL} = 5\text{mA}$ | | | 0.5 | V |

f_{max} TEST CIRCUIT



$C_1 \approx 1000\text{pF}, C_2 \approx 1000\text{pF}, C_3 \approx 0.1\mu\text{F}, R_L = 3 \sim 5\text{K}\Omega,$

Notes : The "H" level of the frequency divider ratio change input M should be 2.6V (min) and 3V (max) when V_{CC1} is used as the power supply, M input can be connected directly to V_{CC1} .
When V_{CC2} is used, "H" level should be seen with in the range of values given above.

TYPICAL CHARACTERISTICS

INPUT AMPLITUDE VS
INPUT FREQUENCY

