

# M54477L/AP

1/128, 1/136 2-MODULUS HIGH SPEED DIVIDER WITH ECL OUTPUT

## DESCRIPTION

The M54477L/AP is a semiconductor integrated circuit consisting of a 1/128, 1/136 2-modulus divider using emitter-coupled logic(ECL).

## FEATURES

- High-speed operation( $f_{max}=1.0\text{GHz}$ )
- Operates at low input amplitudes ( $-20\text{dBm min}$ )
- ECL level output

## APPLICATION

Prescalers for PLL synthesized TV tuners, and general use in consumer and industrial digital equipment.

## RECOMMENDED OPERATING CONDITION

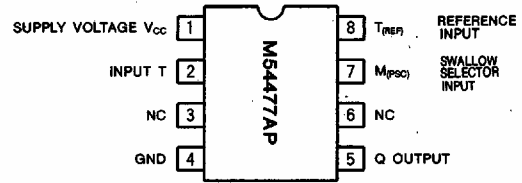
Supply voltage.....4.5~5.5V  
 Input amplitude..... $-20\sim-4\text{dBm}(f_{in}=80\sim 1000\text{MHz})$

## FUNCTION

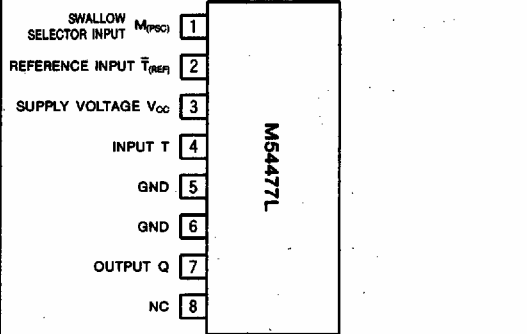
The M54477L/AP, 1/128 or 1/136 prescaler, consists of a high speed frequency divider using an ECL circuit configuration. When the clocks are applied to the pulse swallow control input terminal M, the dividing ratio is 1/136, and when M is stable "H" or "L", it is 1/128. This prescaler operates in the frequency range 80MHz~1000MHz.

The output is the ECL level (1.30Vp-p typ).

## PIN CONFIGURATION (TOP VIEW)



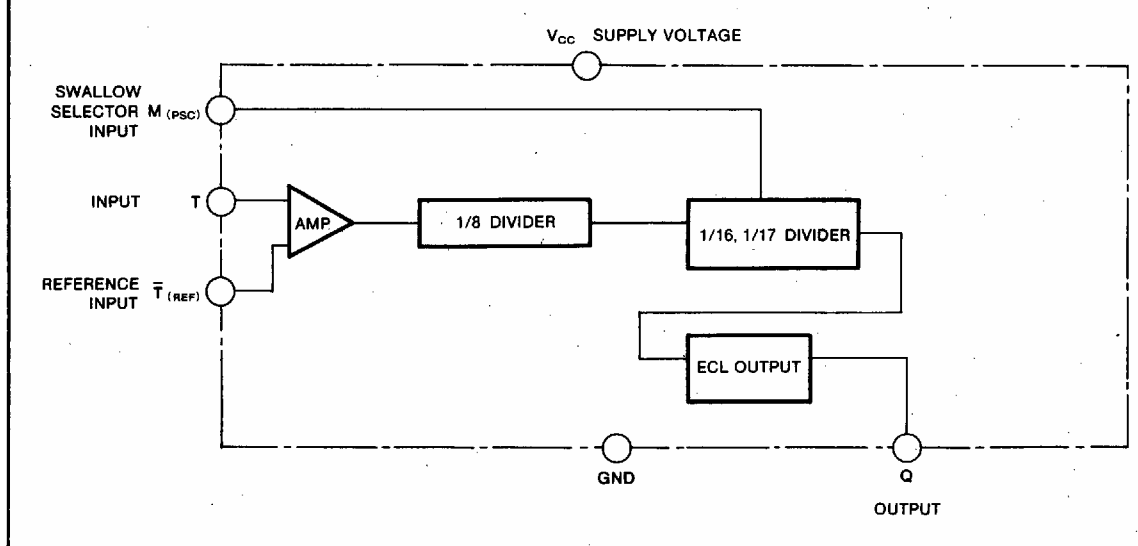
Outline 8P4



Outline 8P5

NC: No Connection

## BLOCK DIAGRAM



1/128, 1/136 2-MODULUS HIGH SPEED DIVIDER WITH ECL OUTPUT

**ABSOLUTE MAXIMUM RATINGS**

| Symbol          | Parameter             | Ratings           | Unit |
|-----------------|-----------------------|-------------------|------|
| V <sub>CC</sub> | Supply voltage        | -0.4~7            | V    |
| V <sub>I</sub>  | Input voltage         | 0~V <sub>CC</sub> | V    |
| P <sub>d</sub>  | Power dissipation     | 1.15              | W    |
| Topr            | Operating temperature | -20~75            | °C   |
| Tstg            | Storage temperature   | -55~125           | °C   |

**ELECTRICAL CHARACTERISTICS** (T<sub>a</sub>=25°C, V<sub>CC</sub>=5.0V, unless otherwise noted)

| Symbol          | Parameter                        | Test conditions   | Limits             |      |                    | Unit             |
|-----------------|----------------------------------|---|--------------------|------|--------------------|------------------|
|                 |                                  |   | Min.               | Typ. | Max.               |                  |
| I <sub>CC</sub> | Supply current                   | V <sub>CC</sub> =5.5V, T <sub>a</sub> =25°C   |                    | 33   | 50                 | mA               |
| V <sub>IN</sub> | Input sensitivity                | f <sub>IN</sub> =80~1000MHz   | -20                |      | 4                  | dBm              |
| V <sub>O</sub>  | Output amplitude                 | f <sub>IN</sub> =80~1000MHz, V <sub>CC</sub> =4.5V  | 0.9                | 1.3  | 1.7                | V <sub>P-P</sub> |
| V <sub>IH</sub> | When the dividing ratio is 1/136 | High-level input voltage<br>M terminal * Note   | 0.7V <sub>CC</sub> |      |                    | V                |
| V <sub>IL</sub> |                                  | Low-level input voltage<br>M terminal * Note  |                    |      | 0.3V <sub>CC</sub> | V                |
| I <sub>IH</sub> |                                  | High-level input current<br>M terminal<br>V <sub>CC</sub> =5.0V, V <sub>IL</sub> =3.5V * Note |                    |      | 50                 | μA               |
| I <sub>IL</sub> |                                  | High-level input current<br>M terminal<br>V <sub>CC</sub> =5.0V, V <sub>IL</sub> =1.5V * Note |                    |      | -150               | μA               |

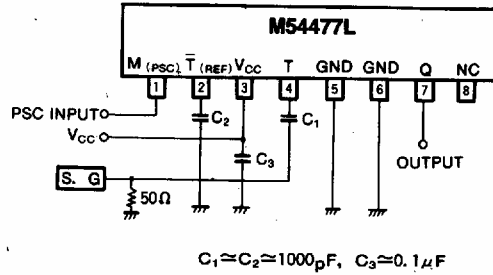
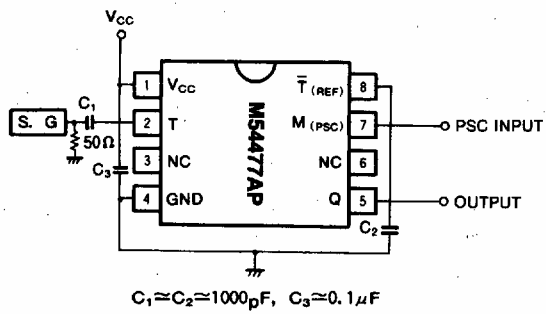
The typical values are at V<sub>CC</sub>=5.0V, T<sub>a</sub>=25°C.

**\* Note : Input conditions of pulse swallow control input terminal M**

| Dividing ratio | Input conditions   | Description  |
|----------------|--|--|
| 1/136          |  | When the clocks are applied to the M terminal as shown in the left figure, the dividing ratio changes from 1/128 to 1/136. |
| 1/128          | V <sub>IL</sub> =0V, V <sub>IH</sub> =V <sub>CC</sub> or V <sub>IH</sub> =OPEN | M terminal is stable at GND or V <sub>CC</sub> or is opened.   |

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**TEST CIRCUIT**



**TYPICAL CHARACTERISTICS**

**INPUT AMPLITUDE VS INPUT FREQUENCY**

