

**SP 8000 SERIES**  
HIGH SPEED DIVIDERS

**SP8675B&M** 1.0GHz ÷8  
**SP8676B&M** 1.1GHz ÷8  
**SP8677B&M** 1.2GHz ÷8

The SP8675/6/7 are high speed counters for operation at input frequencies up to 1.2GHz.

The devices have a typical power dissipation of 470mW at the nominal supply voltage of 6.8V.

The clock input is biased internally and is coupled to the signal source by a capacitor. The input signal path is completed by an input reference decoupling capacitor which is connected to earth. If no signal is present at the clock input the device will self-oscillate. If this is undesirable it may be prevented by connecting a 15kΩ resistor from the input V<sub>EE</sub> (pin 10 to pin 7). This will reduce the input sensitivity of the device by approximately 100mV.

The clock inhibit input is compatible with standard ECL III circuits using a common V<sub>CC</sub> to the SP8675/6/7. A 6kΩ pull-down resistor is included on the chip. The input should be left open circuit when not in use. The SP8675/6/7 outputs are compatible with standard ECL II circuits. They may be used to drive ECL 10K by the inclusion of two resistors as shown in Fig. 4.

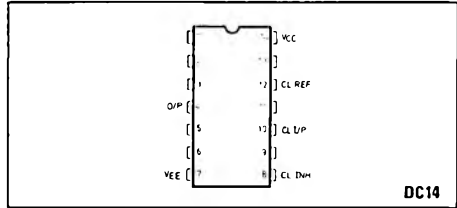


Fig. 1 Pin connections

**FEATURES**

- Guaranteed Operation over Large Temperature Range: 'B' Grade 0°C to +70°C  
'M' Grade -40°C to +85°C
- Wide Input Dynamic Range
- Self Biasing Clock Input
- Clock Inhibit Input for Direct Gating
- Capability

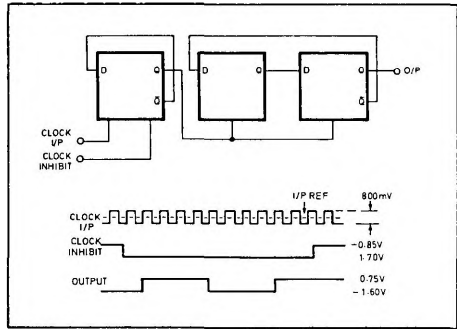


Fig. 2 Logic diagram and timing

**ABSOLUTE MAXIMUM RATINGS**

- Power supply voltage V<sub>CC</sub>-V<sub>EE</sub> 0 to 10V
- Input voltage inhibit input V<sub>EE</sub> to V<sub>CC</sub>
- Input voltage CP input 2.5V p-p
- Output current 20mA
- Operating junction temperature +150°C
- Storage temperature -55°C to +150°C

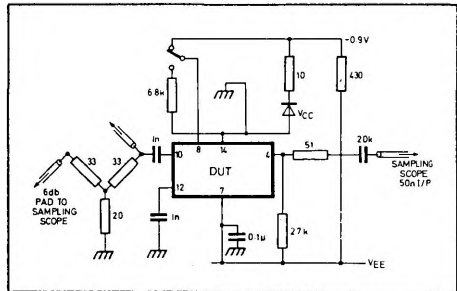


Fig. 3 Test circuit

**ELECTRICAL CHARACTERISTICS**

**Test Conditions (unless otherwise stated )**

Supply voltage	6.8V ± 0.3V
Clock input	AC coupled, self-biasing
Clock inhibit input	ECL III compatible
Output	ECL II compatible
T <sub>amb</sub> 'B' grade	0°C to +70°C (see note 1)
'M' grade	−40°C to +85°C (see note 1)
Supply voltage	V <sub>CC</sub> = 0V V <sub>EE</sub> = −6.8V
Clock input voltage	400mV to 1.2V (peak to peak)

Characteristic	Value			Units	Conditions
	Min.	Typ.	Max.		
Max. i/p frequency SP8675	1.0			GHz	400mV to 1.2V p-p 600mV to 1.2V p-p 600mV to 1.0V p-p
SP8676	1.1			GHz	
SP8677	1.2			GHz	
Min i/p frequency			200	MHz	Sine wave input 400mV p-p Sine wave input 600mV p-p
			150	MHz	
Min slew rate for square wave input			200	V/μsec	
Clock i/p impedance		400		Ω	At low frequency
Inhibit input reference level		−1.3		V	At 25°C compatible with ECL III throughout the temperature range
Inhibit input pulldown resistor (internal)		6		kΩ	
Output pulldown resistor (internal)		3		kΩ	
Power supply drain current		70	95	mA	at 25°C

**NOTES**

1. The SP8677M is tested at T<sub>case</sub> = −40°C to +85°C. The SP8677M requires a suitable heatsink to be connected during operation.

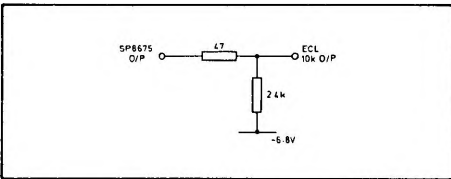


Fig. 4 SP8675 to ECL10K interface

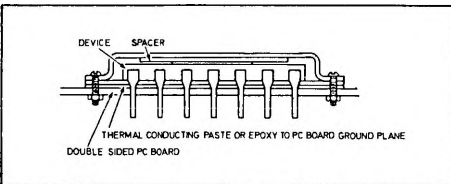


Fig. 5 Heat sink for 'M' grade devices